

This Week in The Iron Age

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The Iron Age

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JULY 18, 1940

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ESTABLISHED
1855



Meet the Man . . .

BACK in the hectic days of 1917, industrialists and technical experts were being drawn to Washington from the four quarters of the country. They came to answer the call to duty; to assume their part in organizing the industrial resources of the United States for war.

It was my privilege to be one of these men and thus to meet and to come to know many of them. During the ensuing 23 years it has been interesting to follow the subsequent careers of some of them.

To me one of the most interesting of these was a young man who in 1917, at the age of 26, had been drawn to the position of executive assistant of the gun division of Ordnance from his former war time position as assistant secretary of the General Munitions Board of the Council of National Defense. A graduate and gold medalist of the University of Virginia and J. D. of Ohio State University, this young man demonstrated exceptional aptitude for getting things done well and quickly, which moved him rapidly up through the ranks from Captain to Major to Lieutenant Colonel and to Chief of Aircraft Armament of the A.E.F. in France. It was of him and of his work in this capacity and as chief of the Coordination Staff of the U. S. Army Air Corps in France that Jacques-Louis Dumesnil, French Secretary of the Air and Navy during the first World War, said:

"It has fallen to you who were one of the most able workers in this great task to show the public how difficult and how costly it is to forge arms under the ever-present menace of the enemy and to show also that wise provisions, rigorous method and an adequate organization are indispensable elements of success.

"Be proud of this new service that you have rendered our two countries, after being one of the most brilliant organizers of victory."

Twenty-three years have passed since this tribute was given to an American soldier by a French Cabinet Minister. And during these years the same powers of mind which enabled the young man to grasp quickly the essentials of military organization have brought him equally outstanding recognition in the fields of science and industry. Today, in addition to being one of our foremost patent attorneys, he is active in the executive guidance of many large corporations as management counsel. He is also chairman of the executive committee of the Hydraulic Press Mfg. Co., vice-president and director of the Empire Investment Trust, president and director of Commonwealth Engineering Co. and member of the board of Ohio State University Research Foundation, which he was chiefly instrumental in establishing.

But this devotion to the achievements of industrial progress in peace times has not detracted from my friend's interest or knowledge in and of military affairs or organization. These interests have been maintained and intensified. Since the war he has been Colonel of Engineers, Colonel of Field Artillery and Colonel of Coast Artillery and is now Colonel of Infantry commanding the 329th infantry of the 83rd division, U. S. Army.

With this uniquely rounded record of experience in military and industrial affairs, who then could be in better position to speak authoritatively on America's defense needs than Col. Harry A. Toulmin, Jr., D.S.M.?

On the following page you will find the first article of a series from his pen on this vitally important subject. It is written and published as a contribution to the cause of American Democracy and its preservation.

J. W. Van Dusen



ARE YOU HELPING YOUR BUSINESS IN YOUR HOME?

DO you help the metal industry by promoting in your home the use of canned food and beverages? Time was when we often overlooked our mutual interest, but today when scientific research and the cooperation of metallurgists and canners have produced the perfect food container, it is time that we do our part.

This is important, not only to canners and steel mills, but to the entire metal industry. When canned food consumption rises, the buying power of growers and canning employees is increased; canneries require more building space and additional plant equipment, and suppliers use more metal parts and in turn buy more manufacturing equipment. An upturn

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WE

THE PAYERS

*The First Line
of Defense
Back to Americanism*

WITH THIS ARTICLE, the distinguished author, Col. Harry A. Toulmin, Jr., D.S.M., begins what is perhaps the most important and timely series that we have yet published.

Preparedness is the product of men, tanks, guns, munitions. These in turn, must be the products of a plan and the plan, in turn, must be the product of experience applied to conditions.

In this vitally important series, the author, ideally equipped for the task, presents a plan to marshal the full powers of our strategic and economic resources for making America impregnable.

By COL. H. A. TOULMIN, Jr.

"MORAL force is to the physical as three to one"—Napoleon.

History is repeating itself in these United States. When in November, 1938, Daladier and Reynaud, justified the decree laws putting France back to work in preparation to meet the invasion, they said this which is significant of our own greatest danger:

"It is our profound conviction (said Daladier and Reynaud) that, fundamentally, the economic question is predominant. But we believe also that unsuccessful poli-

cies have profoundly aggravated the consequences of the continuous deterioration of economic activity. . . . *Actually that part of the French population which creates wealth, which labors for the future, is continually diminishing, while that part which, directly or indirectly lives on the state is constantly growing. . . . There is a steady fall in the number of Frenchmen who are ready to bear the risks of enterprise and creation. . . .*

"That everyone should work more and that the state should spend less—for ourselves we see this as the only formula for salvation; it is elementary but it is inescapable. . . .

"The forty-hour week . . . limits our capacity to work. . . .

"Sometimes . . . the authorities themselves have intervened to pre-

vent the introduction of new methods designed to lower costs. In every field where activity might be reborn enterprise has been restricted and discouraged. The creative spirit and the willingness to take risks have been weakened. This—let us not fear to say it!—is the root of the evil, for it adds a sort of moral abdication to the material difficulties. . . .

"The state must do its utmost to restore the doctrine of risk and profit as well as that of work and output. . . .

"The conclusion of this gloomy survey is that for several years our substance has been melting away. . . .

"Tomorrow, if we do not succeed in achieving a real increase in the production of wealth in France, we shall be unable to prevent the purchasing power of the

working class—even if it be indefinitely swollen by the poisoned gift of nominal wage increases, coupled with diminished production—from being indefinitely reduced by a continuous rise of prices, which would implacably adjust the standard of living of the masses to the persistent inadequacy of the true income of the country.

"The problem then is not to choose between preserving or repealing the recent social reforms, whose generous inspiration nobody disputes. The problem is to prevent them from automatically dwindling to nothing, to prevent their benefits from evaporating in the high cost of living, to prevent employers and employed, in a country which is still poor, from having *nothing to share but poverty.*"

France a Suicide

Since these fatal words Germany, following the diametrically opposite principle, has written the word "finis" to the destiny of modern France. Germany did not defeat France. France committed suicide.

America's greatest problem is to regenerate her national spirit, get men back to work on full hours, open up the opportunities for productive enterprise and reincarnate the adventurous spirit of America that is based upon the profit motive. We can read in the unintentional sabotage of the might of France the handwriting on the wall of our future American history.

It is a challenge of sacrifice for every element in our population to forget their selfish class interests. America must either sacrifice now or be sacrificed later. The stark realism of Daladier's and Reynaud's statement is found in their plea for national salvation "that every one should work more and the state should spend less."

The finest army and the best equipment, if we had it, would mean absolutely nothing unless the support for such an organization in the fields and on the seas is founded upon the willingness to supply that organization and to maintain the government by long hours, hard work, temporary sacrifice of social benefits, elimination of useless pleasures and recreation by all classes, and a reincarnation of the spirit of America. This means that the unfair and restrictive practices under the Walsh-Healy Act, the National Labor Board, the S.E.C., the wasteful excesses of Social Security, the extravagance of the W.P.A. on non-

essential projects, the tangle of restrictions and regulations of administrative bureaucrats who act as prosecutor, judge and jury without judicial review must go. We must streamline our nation for defense.

Our danger is not from without. Our danger is from within by reason of this deterioration of the National spirit in an endeavor to secure a millennium of social events and benefits prematurely. If we are as a nation big enough to temporarily lay aside these laudable ambitions in the present crisis, then we have the opportunity for success.

The foundation of national defense is the integrity of the economic front. It requires the cessation of the imposition of new government controls. It requires the removal of old controls which act as a brake on our industrial machine. It requires a sound fiscal policy with corresponding rigid economy in non-defense expenditures. We

must make a drastic retrenchment in non-defense expenditures. Our public employees must give up 30-day vacations at their pleasure and get back on the same basis as private employees who pay the government employees their salary by these taxes. We must encourage the investment of new capital in new defense plants and equipment because when private individuals invest their money then private individuals automatically get defense production in order to make money.

Instead of having a witch hunt like that conducted by the Economic Committee to provide more social controls, we need a comprehensive, long term revision of our tax structure based upon a study of both national and state requirements. We require a modification of labor legislation to provide automatic machinery for adjusting labor disputes without cessation of work. We must take out of the selfish hands of labor disorganizers the em-

Platform of Recommendations

1—Compulsory military service and universal mobilization.

2—Suspension of Walsh-Healy Act.

3—A revision of the Wagner Labor Act and the division of the National Labor Relations Board functions into separate investigation, prosecution, adjustment and judicial functions with separate organizations unrelated to one another.

4—Removal of restrictions on private financing of industry by the S. E. C. and other agencies.

5—A drastic reduction in non-defense expenditures in national and state governments with all current expenditures paid out of taxes. The investment of national defense is a capital expenditure to be amortized over the years.

6—The encouragement of new capital to be invested in new defense plant and equipment.

7—A comprehensive revision of the tax structure based upon a tax study.

8—A rigid enforced alien policy both by the government and by industry by which no alien could receive employment until first every American would be employed. Many of the alleged refugees in this country are secret agents of foreign governments preying upon our well known gullibility for the unfortunate.

For National Defense

9—The requirement that every man and woman in the public service or in quasi government activities, such as education, should be required to take the same oath that the W.P.A. workers and others under a recent act of Congress must take as to subversive activity or membership in foreign organizations.

10—The finger printing and photographing of every one in the preceding class and of every alien, of whom there are 3,800,000.

11—The requirement that every alien who is not here on temporary visa take the oath of allegiance to the United States and either become a citizen within a limited period or get out.

12—A suspension of social security or the investment of the funds of social security in national defense on the ground that the best social security is national defense.

13—A return to American, two-party government by which no government in power could place in cabinet or other key positions any one but members of its party to have complete party responsibility. Compromise governments and coalition governments have been the downfall of the democracy. The strength of the totalitarian governments is unity in command and we cannot get it in democracy without unitary party responsibility.

ployer-employee relations and substitute a civilized government process of judicial character that has worked in American life since its beginning, providing for labor interests every possible safeguard for fair and prompt disposal of labor controversies without loss of time or wages by workmen.

Compulsory Training

One of the prime steps in strengthening the national fibre is to provide a system of selective compulsory training. This would require registration of an estimated 40,000,000 persons between the ages of 18 and 45. Those between the ages of 21 and 45 should be eligible for compulsory military training.

Our reservoir of youth is practically inexhaustible. The best estimate is that there are over 17,000,000 young men from 15 to 29 eligible for compulsory service. The following is a tabulation of the youth resources we possess:

Age	Boys	Girls
15	1,248,000	1,214,000
16	1,247,000	1,225,000
17	1,224,000	1,202,000
18	1,287,000	1,269,000
19	1,248,000	1,215,000
20-24	5,779,000	5,752,000
25-29	5,375,000	5,512,000

The fundamental thing to be secured from such an organization is



discipline of youth and their education so they become deep believers in our democracy. This spiritual regeneration and moral rearmament of American youth is more important than the actual services which would be secured from such trainees, as valuable as they will be. Such youth would fall into three classes:

1. Those serving with the Army and Navy.

2. Those trained in the technical services incident to the Army and Navy as well as the many civilian branches of both government and civil activities. While such technicians would be a reservoir for the combat forces, yet they also furnish to civil aviation, civil radio communications and other peacetime technical services a vast reservoir of disciplined, educated men and women ready for vocations of practical nature.

3. A non-combatant vocational force disciplined and trained in the agricultural and industrial arts to provide a trained reservoir of young people for industry and agriculture which is the very foundation of national defense.

There is a critical place, now unfilled, in our democratic society, for a communal effort which will weld the minds of our youth as a unit in support of our democracy, instilling a deep love and enthusiasm in them for this country. As a reward, they would be educated for profitable jobs, strengthened physically and returned to society as enthusiastic citizens where fifth columns would find barren ground. It has been estimated by economists that this program would stimulate the national income to a level of \$90,000,000,000 annually and at the same time solve the unemployment problem.

It is significant that the opponents to this plan of Americanism are John L. Lewis and Alfred M. Landon while William Green objects to that part of it dealing with vocational training. I would be more impressed with these objections if any of these men had done anything in national defense or in training the youth of the nation for better jobs.

General Maurice Duval has asserted that Germany could not have beaten France by force of arms alone saying, "We weren't beaten by the Germans,

but by all the agents of treason whom they sent into our country." But the real story was that German agents of treason would have been helpless unless French citizens had at heart been treasonable to their own empire and had lost confidence in its destiny. France's defeat came from greed. Greed by the government in the diversion of national defense funds to other purposes. Greed by capital in indulging in individualism to the point of selfishness. Greed by labor in wanting an impossible short week and short hours at high pay. "The Spirit of Enjoyment took precedence over the Spirit of Sacrifice," said Petain in his farewell to freedom.

A weak government permitted disintegration of industrial plants which were fighting back against communistic labor. This resulted in restricted production and mass dismissals that wrecked French industrial organizations.

We rely upon short working hours and weeks, sit down strikes, unfair labor laws, excessive taxation for social experiments in the depression, while the use of the full hours of the day and week that any public spirited able bodied man should be able to work for reasonable pay and no strikes is the way our opponents do business. This is the short answer to our comparative position with foreign governments, such as Germany.

German System

I have seen German factories employed at 55 hours a week with executives working 7 days a week—6 in the plant and the 7th day in preparing for national defense. Every business man knows that if you have competition, you have to meet it. This is our competition. If America is to survive, it must put its house in order. With our superior machinery, able workmen and organizers we should do better than any other country if we will just give them a chance.

Labor governments of France and England tried to do the impossible with a short working week, strikes, delays, restrictions and red tape imposed by the government. You know the answer. We are guilty of the same rush to so-called "reform" which is not "reform" at all, but the expenditures of public moneys as a bribe to unthinking voters to keep a reigning party in power at national expense.

That is the problem of national de-

fense in a nutshell. Put men back to work on full hours at very good pay, put manufacturers back to work with very good profits, restore the rights of fair play to man and master; and patriotism will do the rest. American workmen constitute the greatest bunch of patriotic men in the world today and there is not one true American among them who would not repudiate the recent spectacle of our great major defense programs being shut down by strikes, to satisfy the selfish whims of labor dictatorship in the very face of the enemy. Work should continue while industrial disputes are adjusted—no time or money would then be lost. Any other course is plain treason in the face of the enemy.

Look at the enormous body of men and women on the public payroll. Each one of them is given a full month's holiday with pay. They do not take this holiday at one time or when it is convenient for the public interest. They take it when they please, at odd times and in such amounts as they please, while the public interest awaits their willful pleasure. One-twelfth of those employed by the United States Government are consistently idle at the public expense despite the security of Federal employment and constant pay without layoffs. Let us put a stop to country club management in government.

The thing that has hurt America is the weakening of our moral fibre by the policies followed in the depression. Instead of getting from the depression its greatest value in the teachings of thrift, cooperation, strength through hardship, devotion to duty, we followed exactly the contrary course of extravagance, teaching that work was secondary, teaching that every man was entitled to a living whether he earned it or not and setting up standards of laziness, disorder, riots, sit down strikes and disregard for constituted authority with the encouragement of all the discontent that comes from such false standards of human conduct. We complain of international anarchy and then set the example to the world of the same thing in our domestic affairs.

This is the Achilles heel of our national defense program. Its only cure is a complete spiritual and physical regeneration of our people—a return to the doctrine of work, thrift and law observance—particularly by our government departments and bureaus.

Shearing of Bar Steel

By D. M. HENDERSON, Jr.
*Supervisor of Mill Practices,
Wisconsin Steel Works,
International Harvester Co.*

—Influence of the Blue Brittle Range and Practices Resulting in Clean, Unbroken Ends.

THE investigation described herein was prompted by the uncertainties and disagreements that arose during the shearing of steel in the merchant mills. In many cases when the sheared ends of bars were rough and broken this condition was entirely blamed on the setting of shear knives or on the condition of shear blades. Setting of the shear was repeatedly checked and shear knives frequently changed, without correcting this condition of sheared ends.

A careful check of shear knives and setting of shears indicated that the cause of poor shearing could not entirely be attributed to the knives or setting, and that the trouble must be due to some other condition.

It had been noticed from time to time that at certain temperatures—using the same knives, shearing steel of same specification, and same size—that good, clean, unbroken ends were obtained; while shearing at other temperatures resulted in rough broken ends. These observations prompted an investigation of actual practice in merchant mills from the standpoint of shearing temperature.

Using the data which appeared in a paper by E. S. Davenport and E. C. Bain (Transactions A.S.M., December, 1935, Vol. XXIII, No. 4) and correlating it with observations and experiences of Wisconsin shearmen and others having to do with the shearing of steel, the opinion was reached that sufficient cold work, as is done on the bar in the operation of shearing, causes strain-aging at those temperatures within the range where the ends of the bar show color. This opinion is based on the fact that when the steel, after being cut within this so-called "blue brittle range," turns either straw color or a light to dark purple on the sheared ends, there is a breaking off rather than a clean cut, such as is evident in a great majority of cases, when the ends of the bars do not visibly change color.

As a first experiment, an investigation was carried out on 3¼ in. square bar as it proceeded in actual practice from the rolling operation to the shear. The material was specification S.A.E. 1040, of the following analysis: 0.40

carbon; 0.68 manganese; 0.018 phosphorus; 0.036 sulphur, and 0.08 silicon.

This bar was sheared in the mill at 1200 deg., 775 deg., 475 deg., 400 deg., 275 deg., and 200 deg. F. When taking these temperatures an Alnor thermo-electric pyrometer was used.

From experience, it was learned that the surface temperature of a bar of this size is about 75 deg. to 100 deg. F. colder than the center of the bar. Thus the cuts were actually made on the bars at the following temperature ranges: 1200 to 1300 deg.; 775 to 875 deg.; 475 to 575 deg.; 400 to 500 deg.; 275 to 375 deg., and 200 to 300 deg. F.

It must be remembered that in this investigation a 3¼ in. square bar with an area of 10.563 sq. in. was used. In a section of this size, with a carbon content of 0.40 per cent, the steel when cut very cold may not shear in a smooth straight line, due to its mass resistance.

Besides noting the condition of sheared ends after cutting in the various ranges of temperature, the sheared

ends of bars were tested on the Brinell machine to ascertain changes in hardness.

The data following are the results of these observations:

Temperature, Deg. F.	Condition of Sheared Ends	Diameter of Impression	Brinell Number
1200 (surface) 1300 (center)	Shown usual smooth lip as noted on blooming mill ends at start of cut, with more than two-thirds of cut rough. No change in color.	4.40 mm.	187
775 (surface) 875 (center)	Shown a comparatively smooth cut and rather straight. No change in color.	3.80 mm.	255
475 (surface) 575 (center)	Shown decided breakage, very pronounced in center, and uneven cut. Color very deep blue at center, shading to lighter blue toward edges.	3.60 mm.	285
400 (surface) 500 (center)	Shown breaking, but less decided, still rather uneven cut. Color straw at center with a faint blue cast shading to lighter straw toward edges.	3.65 mm.	277
275 (surface) 375 (center)	Shown very pronounced breaking, probably due more to mass resistance and cold cut. Color very faint straw in center with complete fading out of color toward edges.	4.05 mm.	223
200 (surface) 300 (center)	Shown smooth surface break at quite an angle, probably due to mass resistance and cold cut rather than to precipitation. Color gray.	3.95 mm.	235

A part of the bar which received no cold work from shear pressure was Brinell tested with the following results: Diameter of impression = 4.40 mm.; hardness number = 187.

It might be well to mention that Brinell impressions were made in the same location on each sheared end, and tested midway between surface and center.

This first investigation proved, without a doubt, that steel in shearing hardens more at temperatures within a certain range than it does at other temperatures above and below that range. It did not, however, definitely determine the exact temperature at which strain-aging starts and diminishes but gave assurance that further investigation would no doubt reveal some fairly definite temperatures at which to expect this phenomenon.

In order to carry on the test without disrupting regular shearing practice, for the second investigation a hot bar was carried from the runout table to a shear set up for the purpose of the investigation. This time a 2¼ x ½ in. flat bar was used, specification S.A.E. 1045, with the following analysis: 0.45 carbon; 0.63 manganese; 0.021 phosphorus; 0.028 sulphur, and 0.18 silicon.

This bar was sheared in the mill at 1065 deg., 820 deg., 700 deg., 600 deg., 550 deg., 450 deg., 400 deg., 350 deg., and 300 deg. F.

both investigations, as well as other observations, indicate that between 500 deg. and 650 deg. F. is the range of maximum effectiveness of this type of strain-aging. It is therefore in this range that greater breaking will be experienced.

The results obtained from these investigations and observations up to date seem to substantiate the findings of E. S. Davenport and E. C. Bain that different means of cold work places temperatures of maximum effectiveness in different ranges of temperature.

As the Brinell readings taken on the sheared ends seem to have a relationship to this shearing in "blue brittle range," the Brinell results are given as follows:

Sample	Temperature, Deg. F.	Diameter of Impression, mm.	Brinell Number
13	1065	4.10	217
12	820	4.00	229
11	700	4.00	229
10	600	3.90	241
9	550	4.00	229
8	520	4.10	217
7	500 +	4.00	229
6	500	4.00	229
5	450 +	4.20	207
4	450	4.10	217
3	400	4.10	217
2	350	4.10	217
1	300	4.05	223

The Brinell reading taken on the part of the bar that did not receive cold work, such as is imparted to sheared ends from shear pressure, was 179 and the diameter of the impression 4.50 mm. This is representative of the true hardness of the steel, which is softer than the ends which received cold work from shearing.

From the record of Brinell numbers on this steel, it will be noted that when the steel was sheared at 600 deg. F., it not only shows a higher

From past experience, it was learned that the surface temperature of a bar this size is very close to its center temperature. Thus the temperatures just listed can be taken as actual temperatures of bar.

Due to this bar being only ½ in. thick, the properties contributed by mass resistance, as experienced when cutting ¾ in. square steel used in the first investigation, can be disregarded.

The following shows the results of the investigation:

Temperature, Deg. F.	Color	Condition of Sheared Ends
1065	steel gray	very good cut
820	steel gray	good cut
700	light slate blue	rough cut, start of ripple
600	dark purple	pronounced breaking
550	golden rust	rough cut, deep ripple
520	grayish, light bronze	slight breaking, no ripple
500	steel gray, faint bronze	slight breaking, no ripple
450	steel gray	good cut
400	steel gray	very good cut
350	steel gray	very good cut
300	steel gray	very good cut

By ripple is meant the noticeable half-moon shape which rises in the surface of the sheared ends.

This investigation, along with the first study, seems to place the "blue brittleness range," as applied to this shearing type of strain-aging between 750 deg. and 450 deg. F., and

Brinell number, but also proves to break more than other samples in shearing. This indicates that at about this temperature the maximum effectiveness of this particular steel strain-aging was in evidence.

Although the Brinell numbers do not show a great deal of difference in

hardness, except at 600 deg. F. (temperature of maximum effectiveness), the condition of the sheared ends indicated that precipitation and its accompanying hardening begins in the region of 750 deg. F. and ends in the vicinity of 450 deg. F. If sheared while the steel is in this precipitation or hardening range, rough or broken cuts will result.

The results of these investigations do not mean, in all cases, that this phenomenon is the cause of all types of uneven and broken sheared ends. For if the shear is not mechanically true, knives are in poor condition, wrong specification of shear knife steel is used for the material being sheared, and knives are incorrectly set, breaking or rough cuts might occur at any temperature. However, if the shears are checked from time to time and put in proper setting and alignment and the breaking of bar ends still persists, then it is possible that shearing at a higher or lower temperature than is being done at the time will cure the trouble.

In order to make practical use of this phenomenon which apparently affects steel in shearing, the following information is given in a form that will enable those responsible for shearing bars to remedy conditions should they experience poor shearing:

(1) See that shears are properly lined up and that shear knives are in good condition. This is the first concern when poor shearing is noted and must be taken care of at once, as the trouble may be entirely mechanical.

(2) Observe the color formed on sheared ends by surface oxidation or temper color. This color film indicates the approximate temperature at which the bar was cut.

A point to remember when observing these temper colors on ends of bars is that the purples appear somewhat differently in artificial light than in sunlight, as they have a more reddish appearance in artificial light. The straw colors, blues, and grays, are affected very little by a change of illumination.

Following is the carbon content of some steels and the temperature as determined from observation at Wisconsin at which pronounced breakage is likely to occur when bars are sheared at or near these temperatures:

0.12 per cent carbon—530 deg. F. Light bronze.
0.38 per cent carbon—570 deg. F. Light purple.
Up to about 0.85 per cent carbon—600 deg. to 620 deg. F. Dark purple to dark blue.
0.85 per cent carbon—530 deg. F. Light bronze.
Above 0.85 per cent carbon—600 deg. to 620 deg. F. Dark purple to dark blue.

The variations in shades of color on the ends of individual bars that will be noted are due to slight increase of

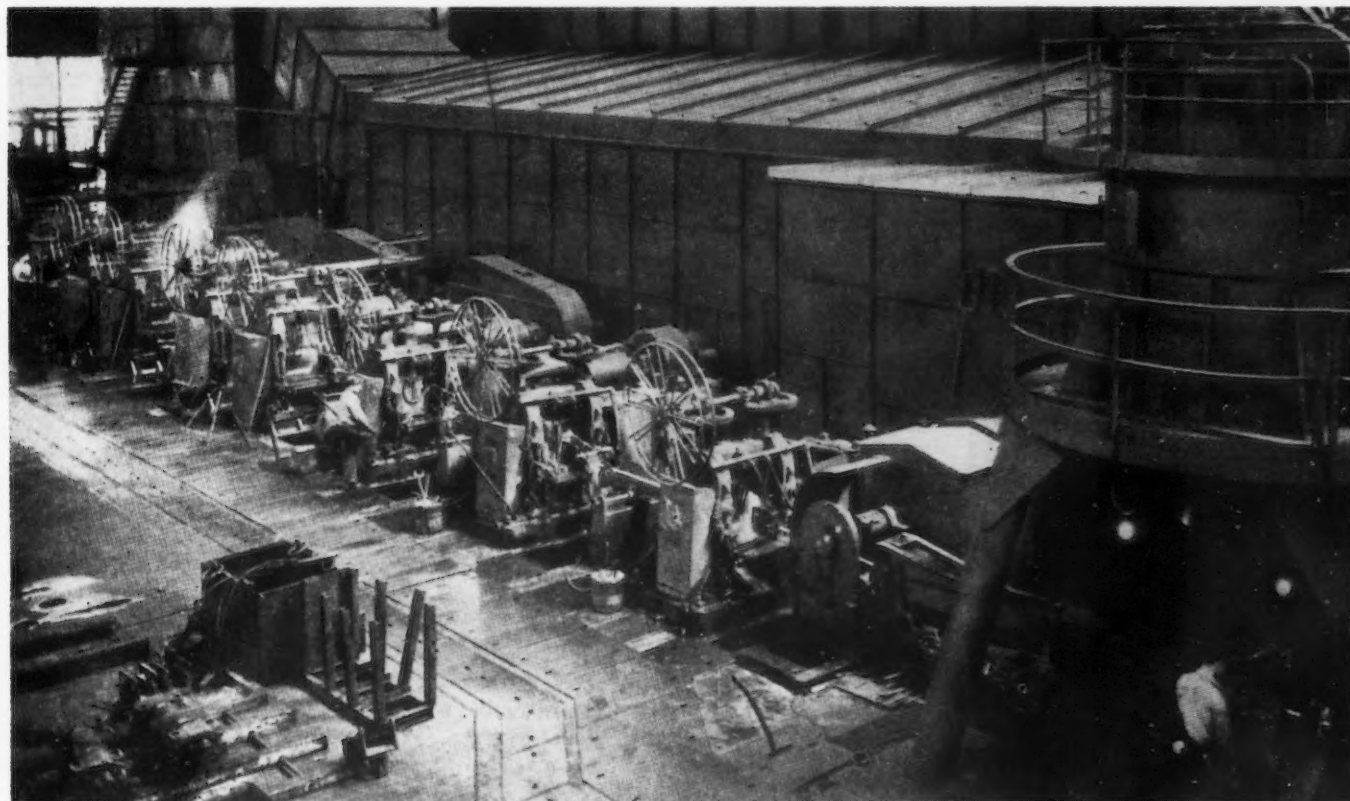
temperature from those mentioned in the table. The center of heavy bars being always hotter than surface of bar will also give variations in shades of color on the ends of the bars.

If those responsible for shearing experience poor sheared ends and shear knives are not to blame, they must arrange to have bars delivered to the shear faster and consequently hotter and above the "blue brittle range," or hold the bars before shearing until colder and below the "blue brittle range."

Care must be exercised, however, not to be deceived by large sections of medium or high carbon steel, as the area of section or mass along with carbon content and alloys influence the resistance to shearing. If a large section of medium carbon, high carbon, or low alloy steel is cut cold, or at around 450 deg. F., breaking or snapping off may result and this of course

is mass influence and has little connection with strain-aging resulting in brittleness.

THE modern bar mill is continuous, the piece passing directly from the roughing stands in the background to the finishing passes in the foreground, then into reelers or out onto a cooling bed.



Low Temperature Brazing

PROCEDURES for using silver brazing alloys are given in detail in the different articles listed at the end of this paper, and only a brief summary will be attempted herein.

Silver brazing alloys flow freely into narrow openings, and clearances of a few thousandths of an inch should be maintained to produce the strongest joints. Fig. 2 illustrates the effect of joint clearance on strength. The surfaces of the joint should be clean, and free from all grease, dirt and oxide scale.

The important point to keep in mind is that there must be a clean, nascent metal surface, that will be wet evenly by the brazing alloy. Any film that prevents the wetting of the joint surfaces will prevent a strong bond being made. After all grease has been removed the surface can be cleaned with emery cloth or pickled with a suitable solution to remove any scale or highly polished surface that has resulted from rolling or drawing. H. M. Webber, in an excellent article on electric furnace brazing* explains fully the difficulties of trying to get brazing alloys to flow on highly polished surfaces and a slight roughening by either mechanical or chemical means is a great help to good bonding.

When joining flat members either with lap or butt joints, it is desirable to grind or machine the surfaces of the joint so that they may be held parallel and equidistant from each other. If thin sheet inserts are used the parts should be clamped together with enough pressure to hold them firmly after the alloy has melted.

When tubular members are joined this pressure cannot be applied and there is nothing to break down the surface tension of the molten alloy and cause it to flow except gravity and capillary action. It is in joints of this type that the preparation of the joint surfaces must be given particular attention in order that the molten alloy

SILVER brazing alloys give joints of high strength, and costs and temperatures required both are low. These factors account for the growing acceptance of this technique. In this conclusion of a two-part article, the author summarizes the procedures for using silver brazing alloys, and discusses fitting, cleaning, assembling and oxy-acetylene heating. In the first part, the various alloys now available were listed and useful data on the selection of grade and form of alloy to meet different conditions were given.

will wet them and spread evenly. If the space is too great the capillary action will not be sufficient to cause proper spreading and if the surface is not wet with the alloy this action is also ineffective. Unless care is taken to prepare and fit joints of this type, parts of the surface may become wetted and the brazing alloy will flow through in irregular channels and even form a fillet at both ends of the joint, thus giving the appearance of a good bond when actually only a very small portion of the joint surfaces are bonded together.

After the members have been fitted and cleaned properly, the joint surfaces should be protected with a film of flux. This flux must be fluid and chemically active at the melting point of the brazing alloy and be spread over the entire surface. It is also advisable to protect the brazing alloy with flux when it is fed into the joint.

Borax or combinations of borax and boric acid are used, but specially prepared fluxes that are fluid and active at lower temperatures are available, and are preferred for the lower melting point alloys. These proprietary fluxes are composed of chemicals

that dissolve refractory oxides readily, and should be used with stainless steels. A flux that has been particularly successful with silver brazing alloys is supplied in paste form and can be brushed along the joint to insure proper coverage.

Jigs should be provided to hold the parts in proper relation during heating. Some types of assemblies require little support but the members should be held firmly together so that no strain will come on the joint until it has cooled to a temperature well below the melting point of the brazing alloy. When the necessary care is taken in supporting the joint members, the workman is free to devote all of his attention to applying the torch flame and he can do much better work in less time.

There are several different methods of supplying the heat necessary for brazing, as shown in Fig. 3. This chart was adopted by the American Welding Society. These different methods of heating are also described more fully in the appended list of papers and only gas brazing will be discussed to any extent at this time.

Gas brazing includes all combinations of torch brazing such as oxy-acetylene, oxy-hydrogen, oxygen and city gas, natural gas and gases such as butane or propane; also air acetylene and air with other gases mentioned.

The air-gas and air-acetylene torches will give satisfactory results with small parts and the large torches or those with multiple flames may be used on fairly large work. However, the tendency to use an oxidizing flame in order to heat the work quickly with air torches is one of their disadvantages for use with silver brazing alloys.

Fortunately, there is available the oxy-acetylene torch, which has been highly perfected and can be obtained in a great variety of sizes and types. It is probably the most widely used torch where rapid heating is an advantage, and it has great flexibility in the hands of a skilled operator.

Because of the high temperature of the oxy-acetylene flame there is no

*"Capillary Attraction and Wetting Action Explained," THE IRON AGE, Nov. 3, 1938, fourth of a series on "Electric Furnace Brazing."

With Silver Alloys

By ROBERT H. LEACH
Vice-President, Handy & Harman,
Bridgeport, Conn.

temptation for the operator to run it on the oxidizing side, and he can obtain all the heat required and still keep to the softer flame a little on the reducing side of neutral. It might be compared with the modern eight-cylinder automobile engine, and the air-gas torch with the two-cylinder engine of years ago. There may be some basis for the argument that an unskilled operator can do less damage with an air-gas torch, but what is desired when brazing with silver alloys is an effective means for quickly and evenly heating the joint with a neutral or reducing flame. Of course care must be taken in the use of the oxy-acetylene torch to keep it in motion and not let it play too long on one spot, but an intelligent workman will soon master the proper technique and he then has an instrument that will enable him to control the heating most efficiently.

Manufacturers of oxy-acetylene torches are always willing to cooperate in the design of special tips or torches with multiple tips to meet any specific requirements.

They can be used for such extreme conditions of heating as the silver alloy brazing of fine wires in Fourdiner screens, on the one hand, to brazing 42-in. in diameter flange joints on the other.

Fig. 4 shows a two-flame No. 10 tip heating a large flange assembly, and Fig. 5 a small multi-flame torch for small parts.

To obtain full benefit from these low temperature silver brazing alloys, the workman should be trained to observe the rate at which different metals become heated to the brazing temperature and to give particular attention to relative mass of each of the members being brazed. Metals of high heat conductivity such as copper should be preheated some distance from the joint and if there is much difference in the size of the parts then the one with largest cross-section should be given the most heat.

Unless inserts are used, the joint surfaces should be heated to a temperature at which the brazing alloy will

flow freely before attempting to feed the alloy into the joint. Although it is not advisable to keep the torch flame on the molten alloy and the expression "let the heat in the joint melt the alloy" is often used, a skilled workman can take advantage of the heat of the flame to melt the alloy, which then flows quickly into the joint. In all cases, however, the joint surfaces must be heated above the flow point of the alloy or a good bond will not be made. When the joint members vary greatly in thickness, as when thin wall piping is brazed into a heavy flange, care must be taken to heat the flange until the inner surface which joins the pipe is at the correct temperature for the particular brazing alloy that is being used.

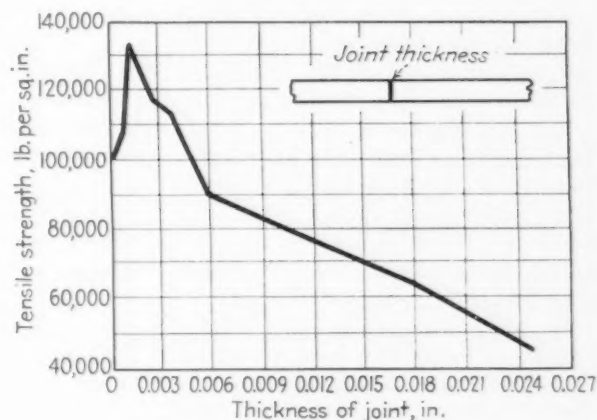
Probably one of the most difficult

things that the workman has to acquire is the ability to judge when the joint is at the required temperature and at the same time not overheat the joint. Benches placed before windows are not good places to work because of the extreme variations in light conditions; and strong drafts are also bad. The appearance of the flux is a guide, but if a flux is used that is fluid at a temperature several hundred degrees below the proper brazing temperature the best indicator is to touch the alloy to the heated joint. In order to speed up the work there is a tendency to overheat the joint with consequent damage, and workmen should be trained to judge the heat with reasonable accuracy.

In the electrical field, transformer leads and taps are brazed with silver

AT RIGHT

FIG. 2—Relation of joint thickness to tensile strength based upon butt joints of stainless steel to stainless steel.



BELOW

FIG. 3—Various methods of supplying the heat for brazing.

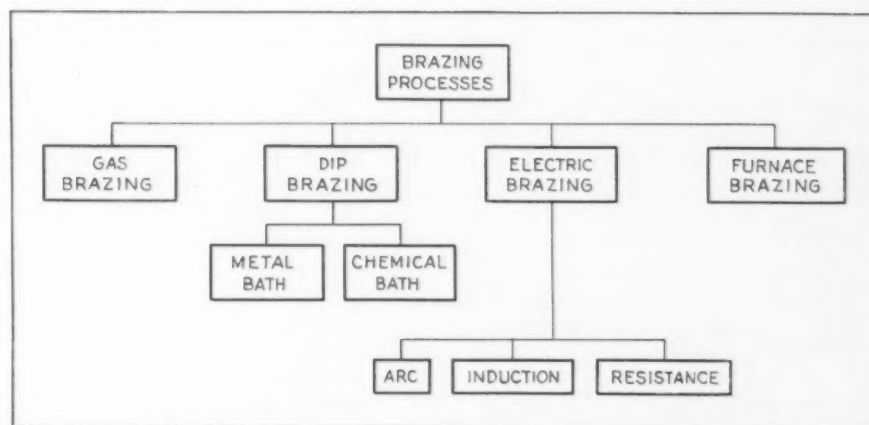




FIG. 4—Two-flame No. 10 tip heating a large flange assembly.

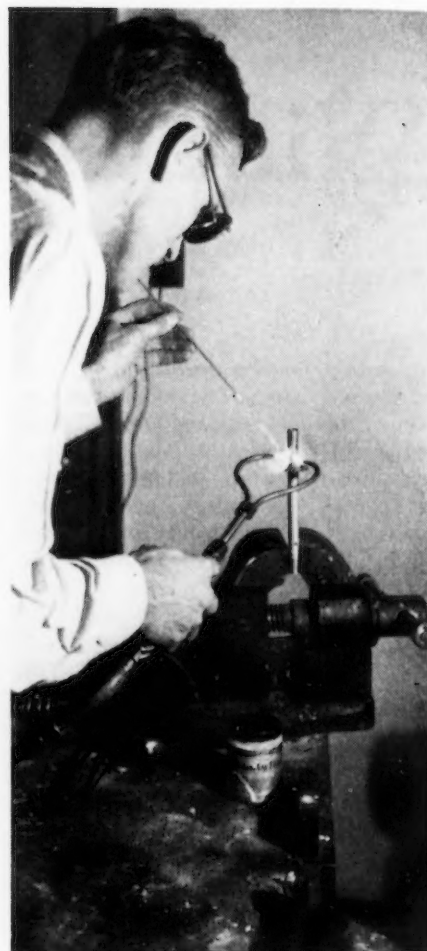


FIG. 5—Small multi-flame oxy-acetylene torch for small parts.

alloys because of the low temperatures at which strong shock resistant joints of high conductivity can be made.

Joints in bus bar installations of all kinds are being made with these alloys because of the high strength, corrosion resistance and elimination of voltage drop. Fig. 6 shows a bus bar assembly being brazed. Ground connections and cable joints are also made.

In the manufacture of electric motors, end rings are bonded to rotor bars, and many small parts in the manufacture of electrical equipment are brazed with silver alloys.

Lacing wires and shrouding are joined to turbine blades and in certain types of turbines the blades are silver-alloy brazed to packing pieces.

One of the largest new uses of silver brazing alloys is in the manufacture of refrigeration units, both household and industrial. The low temperature at which they melt and the strong corrosion-resistant joints make them particularly desirable for joining the light metal sheets and tubing used in this industry. Joints are leakproof and when proper attention is given to design the cost is remarkably low.

Use of these alloys in air conditioning systems is extending rapidly, and

has eliminated the breakdowns that occurred with soft soldered joints and were often serious and caused damage from the escape of refrigerant.

Standard pipe and fittings up to 10-in. or more in diameter are now being joined in increasing volume with silver alloys, and tests on joints made in this manner show failure in the pipe or fitting rather than in the joint when the work is done properly. Special fittings are being made with rings of silver brazing alloy fitted into grooves cut in the fittings, and this type of joint is being specified for marine and Navy piping, and piping in buildings. Installations of silver alloy brazed pipe and fittings in large steam plants have been in use for several years, and have given complete satisfaction.

Joints made with silver brazing alloys on both similar and dissimilar metals for steam lines and boiler construction have been subjected to extreme tests entirely beyond anything to be expected in use and no signs of failure occurred in the brazed joint. One example is a steam boiler having 1237 copper tubes joined to mild steel headers 48 in. in diameter and $\frac{3}{4}$ in. thick. Brazing was done with a silver alloy melting at 1175 deg. F. and under

test this boiler was fired to 225-lb. pressure, steam and water blown out and cold water immediately pumped into the dry hot boiler. Repeated firing and cooling showed no failure in the brazed joints. Similar tests on assemblies of heavy wall copper tubing and fittings brazed with an alloy melting at 1300 deg. F., showed no failure when subjected to a steam pressure of 200-lb. per sq. in. and followed by the introduction of cold water for many repeated cycles.

Another unusual application was the construction of underground gas mains from heavy wall copper tubing, using butt joints brazed with the silver copper phosphorus alloy which was previously mentioned. Ordinarily a bell and spigot type of joint would be used and it was recommended in this case. However, the results with the butt joints were so satisfactory that they were adopted.

Standard fittings with inserts of silver brazing alloys can be obtained for pipe sizes up to 10 in. in diameter or larger and flanges as large as 42 in. in diameter. The oxy-acetylene torch has been most successful for heating joints of this type and there is every indication that this method of joining

pipings and fittings will show a large increase in the future.

Silver brazing alloys are being used in the manufacture of many different articles used in the home, such as cooking utensils, hot water tanks, water heaters, flat irons, metal furniture and other applications where soft solders do not give the necessary strength and the temperature required for base metal brazing alloys or welding rods would be too high. Fig. 7 shows a copper hot water tank being brazed with a silver brazing alloy which melts at 1300 deg. F., the heating being done with an oxy-acetylene torch.

Silver brazing alloys are used in considerable quantities for the manufacture of chemical equipment, dairy and creamery equipment and in plants and equipment for the dye industry.

There are innumerable applications in the electrical, automotive and airplane industries where instruments, oil filters, oil coolers, gear shift levers, steering wheel spiders, contact joints, window frames, oil lines and radiator

grilles are being brazed with these low melting silver alloys.

A suitable silver brazing alloy is available for making practically every type of joint on nearly all metals and alloys that melt at temperatures above 1250 deg. F. As engineers become better acquainted with the strong neat joints that can be made quickly and economically with these alloys, at comparatively low temperatures, their use will be extended rapidly.

The author expresses his appreciation to his associates for their assistance and to Handy & Harman for permission to publish this data; also to the Air Reduction Co. and to the Walworth Co. for photographs.

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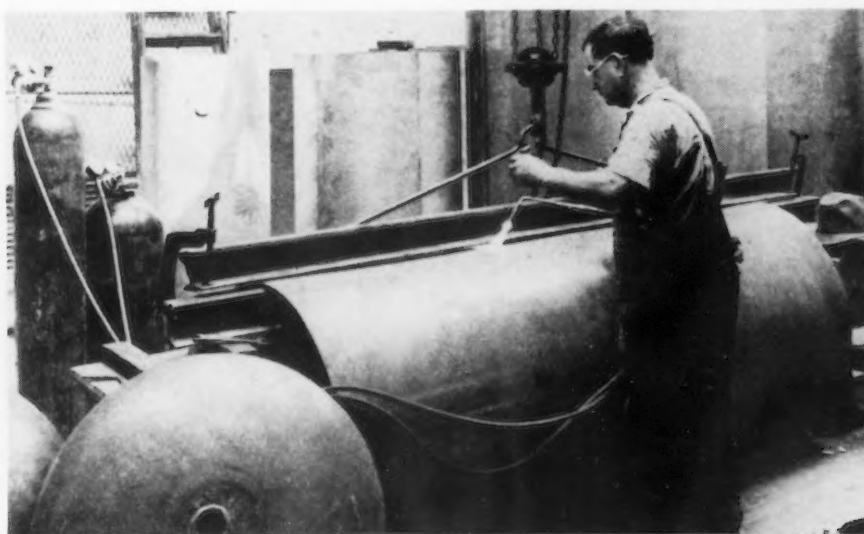
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FIG. 6—Bus bar assembly being brazed. (Left)

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FIG. 7—Copper hot water tank being brazed with a silver brazing alloy that melts at 1300 deg. F. The heat is supplied by an oxy-acetylene torch.



Atomic Hydrogen

—For welding hot strip off the 30-in. mill at the Otis plant to keep pace with the demand for larger coils. New equipment includes coil box, leveler, side guides, shear, pinch rolls, welding unit and tight coiler.

THE constant consumer demand to obtain longer coils has influenced many steel companies to weld coils end-to-end. Otis Steel Co., Cleveland, has for some time welded strip coming from the 30-in. continuous mill. At first one coil end was welded to another by means of the metal arc welding process. The next method tried was welding with acetylene gas. It was then decided to weld these strips by means of the atomic hydrogen welding process.

The Otis Steel Co. then purchased a thyatron-controlled automatic atomic hydrogen arc welder with a filler rod device which also is operated with thyatron control and vacuum-tube timers. This is the first automatic hydrogen welder applied to the welding of long steel strips and the first rod feeding device operated with the new thyatron control and tube timers.

In the atomic hydrogen welding process an alternating current arc is maintained between two tungsten electrodes and at the same time, a stream of hydrogen gas is passed through the arc and around the electrodes. This

By R. M. FENTON
Chief Engineer, Otis Steel Co., Cleveland,
and
E. W. DOUGHERTY
Supervising Engineer, Cleveland Office,
General Electric Co.

o o o

hydrogen gas as commonly furnished for commercial purposes is in the molecular state and each molecule consists of two atoms. The intense heat of the electric

arc breaks down the molecular hydrogen and it becomes atomic hydrogen which has absorbed a large amount of heat.

Atomic hydrogen is not a stable form of the gas. It is extremely active and will combine with other elements to form stable compounds or with other hydrogen atoms to form stable molecular hydrogen. Molecular hydrogen continually being blown into the arc displaces the atomic hydrogen. This action removes the atomic hydrogen from the intense heat of the arc and becoming cooler, it recombines to form molecular hydrogen and in doing so, gives up the heat absorbed in its dissociation. This heat transfer mechanism provides an extremely effective means of getting rapid localized heating for welding. Rates of surface heating by atomic hydrogen may be as high as 1300 watts per sq. cm.

Atomic hydrogen welding is used in the welding of steel and ferrous alloys

such as chromium, nickel and molybdenum steels; non-ferrous metals and alloys such as aluminum, duraluminum, nickel, monel, copper brasses and bronzes.

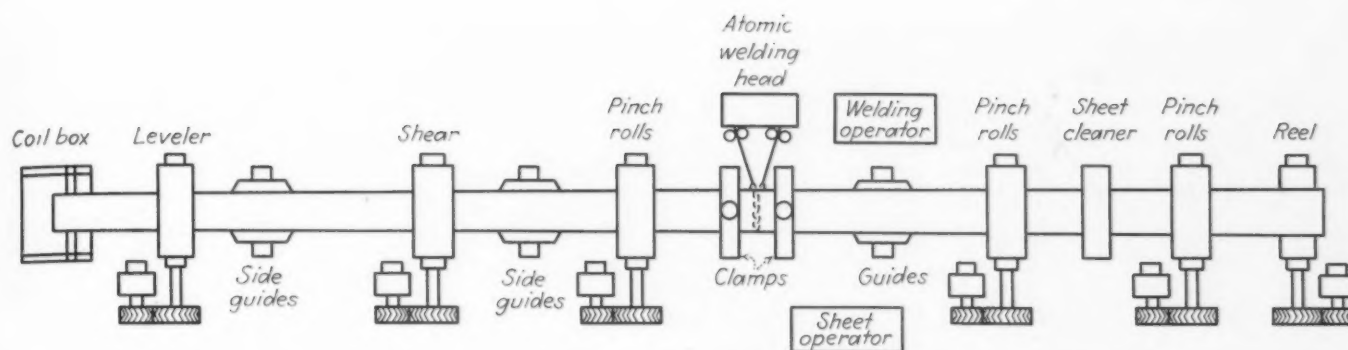
There are several important functions of the hydrogen in this type of welding. First it acts as heat intensifier as explained above. Second, it envelops the work in a reducing atmosphere which reduces surface oxides and prevents further formation of oxides and other impurities which would make a weld brittle. Third, it protects the tungsten electrodes and keeps them from being consumed rapidly, the speed of consumption being approximately 1 in. per hr.

Thus, the production of a very strong and ductile weld, free from porosity and having an exceptionally smooth and finished appearance, is made possible.

The amount of hydrogen gas dissociated by the arc depends upon the arc current, and in turn the amount of heat available for welding depends upon the amount of hydrogen dissociated. Hence for welding heavier metals, larger currents are necessary; but very little more hydrogen is needed because there is always a liberal excess present as a protective atmosphere. The amount of hydrogen fed into and around the arc is governed by a hand operated valve on the hydrogen tank and this valve is set so as to give a pressure of 3 to 8 lb. of hydrogen. The hydrogen is then turned on by the operator from push button control of an electric valve and automatically turned off when the arc is broken.

In automatic atomic hydrogen welding there are four factors which must be held very constant if a uniform weld is to result. Two of these—the welding speed and vertical relationship between the welding head and work—are very simple electrical and mechanical problems. The third—the value of the arc current—is simply controlled through the raising or lowering of an iron core within an electric coil.

The fourth factor is the size or length of the arc and this problem has been solved successfully by means of thyatron motor control. The length of an electric arc and the voltage drop across it bear a definite relationship. This fact has been used by applying the arc voltage to a system of vacuum tubes to regulate and maintain this arc length at a predetermined value. This regulator of arc voltage automatically causes the direct current motor to raise or lower the two tungsten electrodes which converge at an angle of



about 60 deg. to each other and the plane of which is practically perpendicular to the work. These two electrodes in their carriers can be equalized in length by hand control, but during automatic operation, they are driven up or down through motor operated gears to bring back to normal quickly the slightest arc change.

With this thyatron control, the arc is struck quickly and the unusually high speed action is three to ten times faster than certain other types of relays. There is no time lag for build up of magnetic fields or operation of relays because it employs vacuum tubes which have no moving parts and which respond instantly to electric impulses without any tendency toward hunting or instability. The fan shaped arc which is the result of the electric arc and the hydrogen stream is about the size of a dime cut in half and the fan thickness is about 1/16 in. This fan can be adjusted to lie at an angle

SCHMATIC layout of new equipment for hot strip welding line.

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to the weld seam or to be parallel to this seam. Thus the heat zone in the weld can be made wide or very narrow, but being in a hydrogen atmosphere, the metal is left clean and bright.

It has been necessary to use a filler rod on the Otis Steel welder since the strip ends are sheared off square instead of being turned up for melting down. For this purpose a standard G-E Type WFB automatic arc welding electrode feeding device has been used to feed the rod. The control for

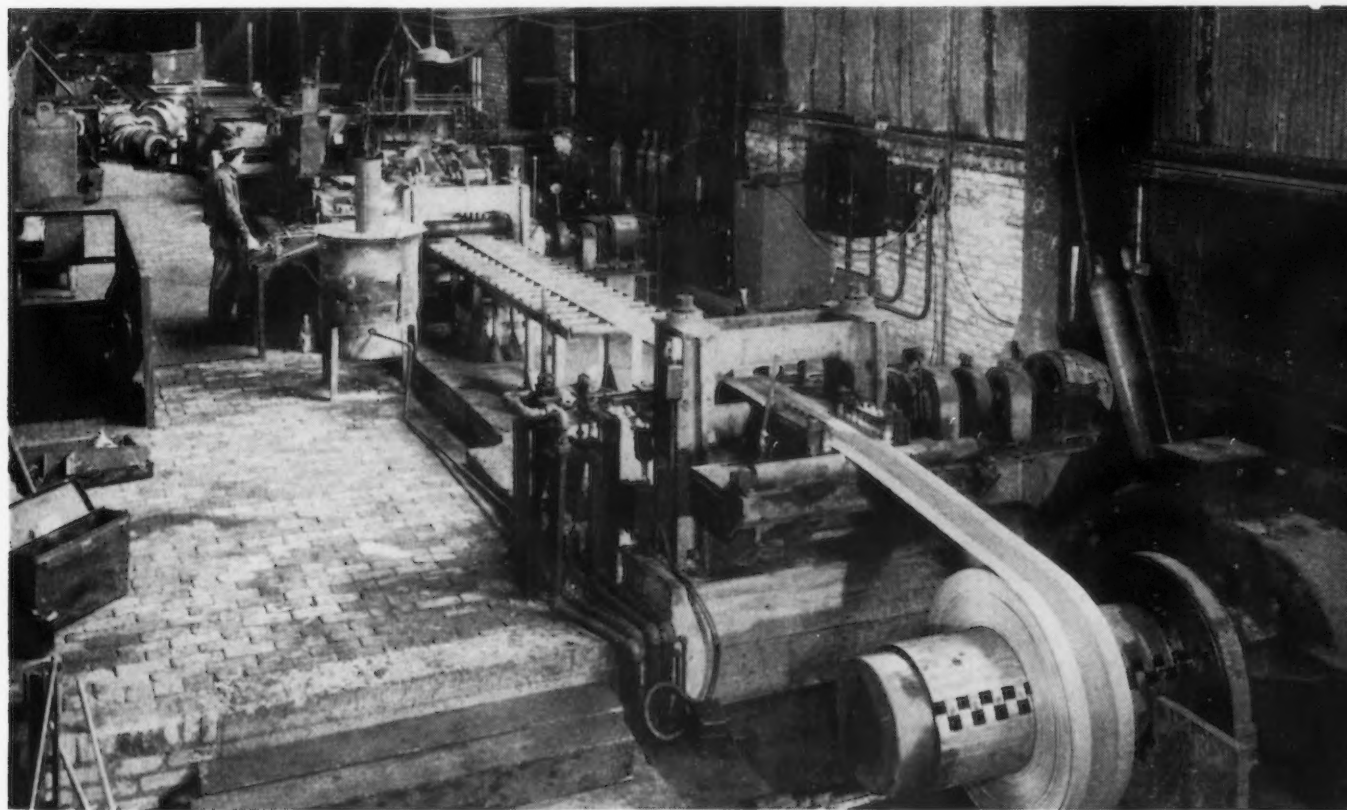
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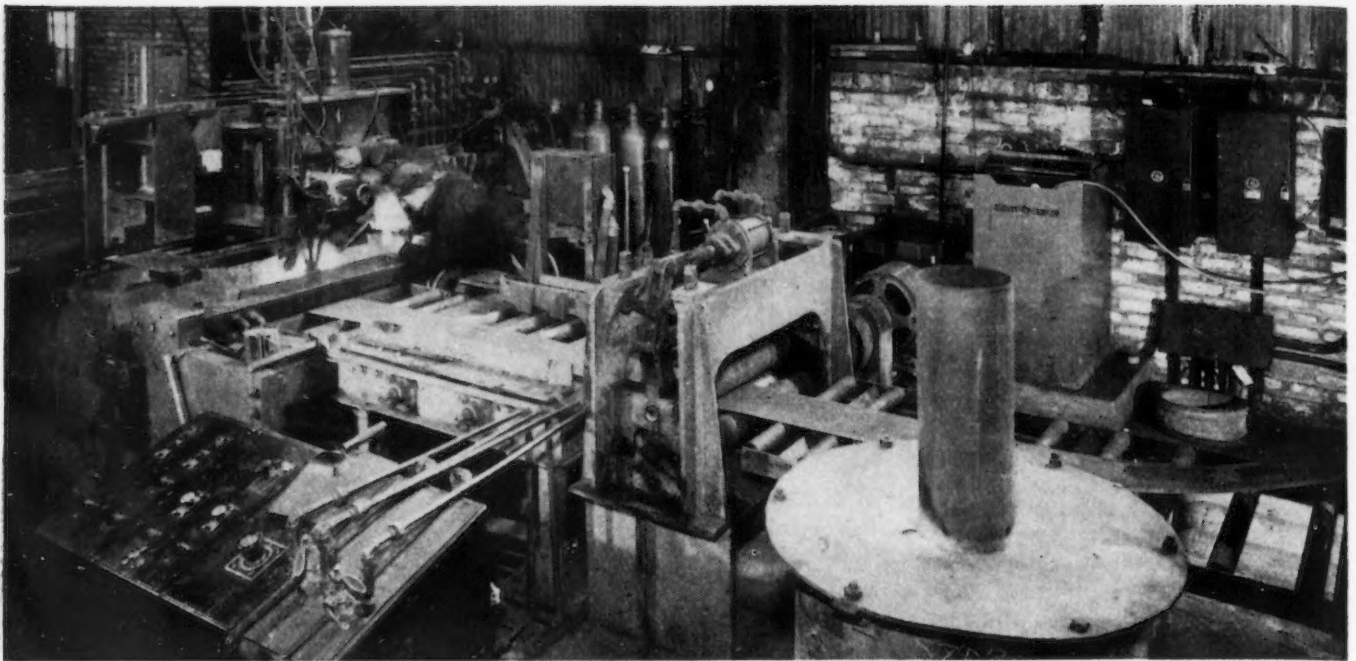
GENERAL view of the entire atomic hydrogen strip welding line; at the Riverside plant of the Otis Steel Co., Cleveland.

this rod device is the same as that used for the atomic hydrogen arc except that two vacuum tube time delay relays are added to the thyatron motor control circuit. The function of these vacuum tube time relays is to regulate the thyatron controlled motor so as to feed the filler rod in to the trailing edge of the atomic arc fan for a definite time and then pull the rod back from the fan. This process is continued alternately along the weld to fill the weld up to the desired height. This device has operated nicely and it has been found that keeping the rod feeding almost at constant speed into the fan with just a fraction of a second hesitation, gives a nice smooth quality weld.

Fig. 1 shows a schematic layout of the welding line which is placed at the end of the 30 in. hot strip mill line.

The welding line consists of a coil box, leveler, side guides, shear, pinch rolls, welding unit and tight coiler.





The line is designed to take care of coils $4\frac{1}{2}$ in. wide to 28 in. wide and with a maximum outside diameter of the finished coil of 52 in. The smaller coils which are used to make up the larger welded coils are placed in a coil box from which they are uncoiled and then passed through a leveler to flatten the steel. This first coil is then lined up with the adjusted side guides and sheared. The sides are trimmed and this coil is recoiled tightly at the end of the line with the trailing end still under the welder clamp. The second coil is now leveled and sheared and butted against the trailing end of the coil ahead. The ends are now clamped and welded after which the sides are trimmed and the steel recoiled tightly. The line up and weld is repeated until about four small coils are united into one. The coils are then firmly banded and are ready for shipment to the customer.

GENERAL view showing steel sheet operator's station, welding operator's station and atomic hydrogen welding equipment. In the foreground is the control panel for sheet operation.

Furnishing coils in this manner enables Otis Steel Co. to meet the increasing demand of customers who want larger coils with which to increase their production and also hold their scrap losses to a minimum. Production is increased and simplified by eliminating the time lost in threading a larger number of smaller coils into their machines. By using the larger coil which is equivalent to four coils in one, anywhere from 15 to 20 min. per large coil can be saved. This saving is computed on the assumption

that the handling of the smaller coils, including transferring by crane to the entering coil box of the machine and putting into shape to thread into the machines, consumes about 5 min. per small coil. Likewise the general efficiency of the department is increased due to the less frequent need of crane service and the more continuous employment of the men on the particular machine being operated.

The weld in this line is very uniform having a grain structure similar to the grain structure in the strip. Since the physical properties of the weld are similar to the physical properties of the strip, it makes it possible to use the large coil including the welds, in many stamping and forming operations. Similarly, the welding apparatus opens up other possibilities in manufacturing processes, particularly where cold roll material is involved.

Thermostats Arc Welded

WHAT is believed to be the world's smallest arc welded machine part is shown in Fig. 1.

It is a tiny worm gear and spindle—about the size of a match and weighing only 1/10 oz.—used on approximately 50,000 thermostats manufactured by Robertshaw Thermostat Co., Youngwood, Pa.

The worm gear, which is a screw machine part of 18-8 stainless steel shown between the thumb and index finger, is hollow and fits over the end of the small round shaft of Envar metal. The gear is welded to the shaft by the manual carbon arc process of electric welding, using equipment supplied by the Lincoln Electric Co., Cleveland. Current for welding is only 30 amp.

Also believed to be the world's smallest arc welded part of its type is the jig shown at right in Fig. 2. It is used by Robertshaw for assembling the thermostat part shown on the left of the same illustration. The jig weighs only 4½ oz. It is com-

posed of a piece of machined stock to which a piece of stainless steel is arc welded. It contains a set screw (indicated by hole) which holds the work firmly in position during assembly. Overall dimensions are 1½ in. wide, 1 9/16 in. high and 21/32 in. thick.

Another important use for arc welding at Robertshaw Thermostat Co., which saves the company hundreds of dollars yearly, consists of correcting defects in aluminum and bronze castings. Defective aluminum cast parts are corrected by applying new metal with Aluminweld electrode. In bronze castings, the work is accomplished by using Aerisweld electrode, manufactured expressly for arc welding bronze, brass and copper. After welding, the parts are re-machined and put into production.

The arc welded tank is filled with water and the thermostat operating mechanism is immersed in the water which is maintained at accurately controlled boiling temperature. While at this temperature, the hollow copper tubing of the thermostat is

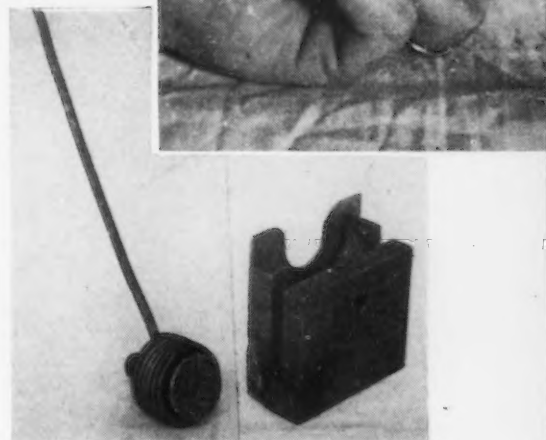


FIG. 1 (at top)—Probably the world's smallest arc welded part—a worm gear and spindles of a thermostat weighing only 1/10 oz. **Fig. 2**—World's smallest arc welded jig used in assembly of thermostat parts at Robertshaw Thermostat Co.

crimped at the end and sealed by silver soldering. Maintenance of exact temperature assures the proper amount of expansion when subjected to the heat of the oven.

On the Welding of Cast Iron

THE welding of cast iron is a highly interesting subject, and an article on that problem in the June 27 issue of *THE IRON AGE* by L. Tibbenham brought forth the following interesting commentary by P. Hall, president, Hall Planetary Co., Philadelphia.

"Thought it might interest you to know that about 35 years ago there was a man above Trenton, N. J., who had a very small shop in which he welded cast iron without heating the piece to be welded and made the weld stronger than the surrounding iron. This man died with his secret. He would not even give it to his son. The writer talked with him in 1907 and asked him to kindly give the secret to his son so that cast iron could be welded after he passed out of the picture.

"At that time the writer was building very high grade gasoline engines for motor boats and our first experience in getting this man to do weld-

ing for us was by getting the water jackets welded. These water jackets were 5/16 in. thick and had a hole blown out of them about 6x8 in. due to hydraulic pressure. This man straightened up the hole, making it exactly square, putting a bevel on the side of the hole and putting a cast iron plate in the hole. He then welded the plate in the hole so beautifully that when the weld was ground off, there were no defects in the weld. We, wanting to test the weld, put hydraulic pressure on the cylinder again and this time broke out the casting around the weld but the weld or near the weld did not break. We then returned the cylinder to the welder and again he put in a much larger piece. In neither case was the cylinder heated. After this we sent quite a few cylinders to this man but no one could find out how he made the weld.

"Since then the writer has broadcast

all over the country to find out if anyone knew how to weld cast iron. About eight years ago we were told that there was a man in the Chevrolet Gear and Axle plant, Detroit, who could weld cast iron. When in Detroit the writer called on him and he told me he could not weld cast iron and that no one could weld it properly as the structure of cast iron made it impossible to weld. I told him my experience but I do not think he believed it as he had been trying to weld cast iron for a great many years. All of the men in our shop saw the finished welding of quite a few of our gas engine cylinders and strange to say the enameling on the cylinder was never even discolored from the cylinder being slightly heated.

"If this man's secret could be found today, it would save the manufacturers of the United States millions of dollars. The weld was stronger than the surrounding iron."

Carbides for Small-Lot Work

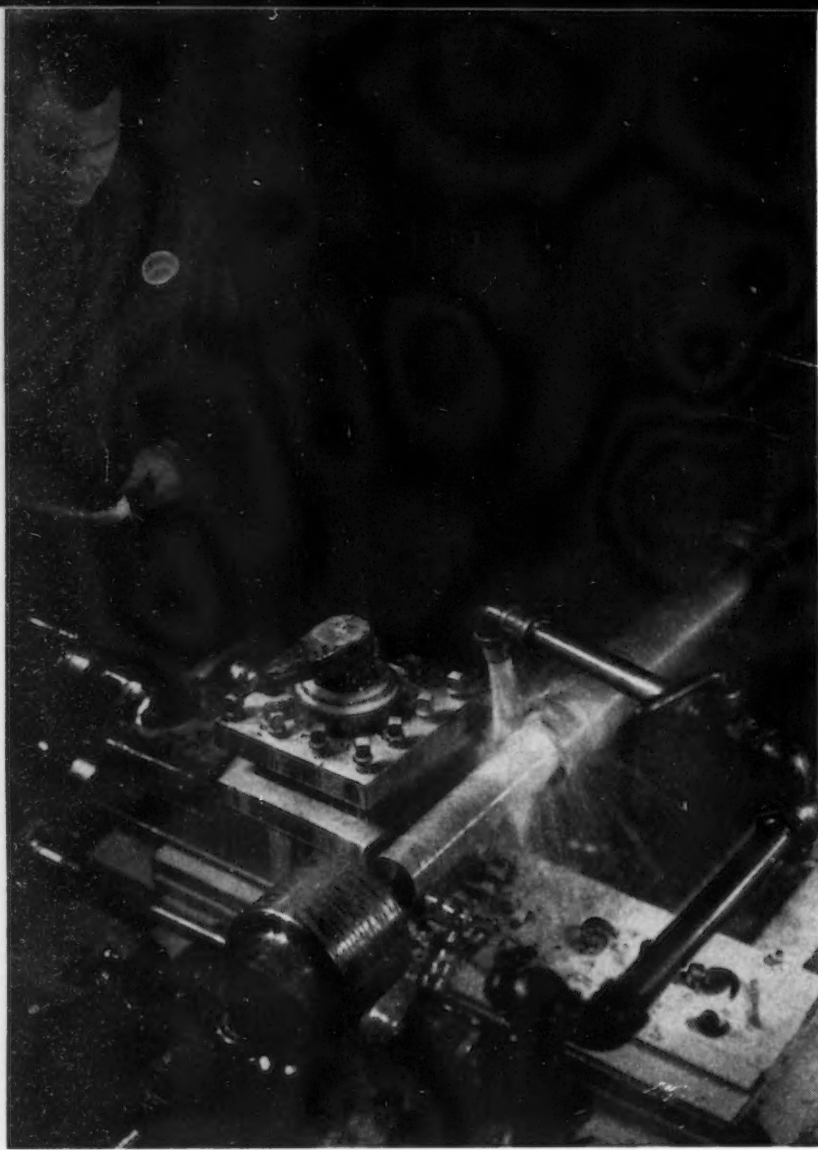


FIG. 1—Turning a 3¼-in. S.A.E. 2350 steel shaft with a carbide tool. Cutting speed = 247 ft. per min.; feed per min. = 9.250 in.; feed per rev. = 0.028 in.; maximum depth of cut = 33/64 in.; cutting time per piece = 2.55 min.; former time using H.S.S. tools = 6 min.; maximum metal removed per min. = 35.3 cu. in.

By P. A. ABE

*Vice-President in Charge of Production,
Monarch Machine Tool Co., Sidney, Ohio*

TODAY, with many metal working plants straining every resource to increase production, carbide tipped cutters have assumed a position of tremendous importance in small-lot shops. For without an expansion of plant, without addition of new equipment, or increased manpower or man-hours, carbide cutters are making it possible to double and even triple production on a good many machining jobs.

In the Monarch plant, already operating far above even an emergency capacity, it has been found exceedingly profitable to re-explore and re-study continually the possibilities of greater and greater carbide installation.

Almost a thousand jobs in the plant are already tooled with carbides and more are being changed over every week. Average increase in production

is estimated to be about 105 per cent and the figure in one case has been nearly 400 per cent.

The company's experience with carbide cutters dates back to the "stunt era" of the late 1920's. At first, during those early days when so much was being heard about the new carbide tipped tools, more attention was given to re-designing the lathes to meet the more severe requirements involved than in actually using the new tools in the shop itself on production work. Their cost was entirely too high for small and average-lot work.

At the 1929 Machine Tool Show the Monarch company was machining steel as well as cast iron—with both continuous and interrupted cuts—at surface speeds for cast iron up to 600 ft. per min. and for steel up to 400 ft. per min. This was definitely a stunt,

of course. Although the machines had already been designed to provide the necessary increased power to the spindle and the increased rigidity to the tool supporting elements, carbides were not being used on those machines for production work at Monarch, except experimentally.

As the depression began to lift during the middle 1930's, however, it became imperative that maximum production be secured from the limited equipment then available. The term limited equipment is used because not many new machines had been added to plant facilities in the whole four-year period prior to 1935. Carbide tools seemed to offer some real possibilities. Their cost had been considerably reduced in the meantime.

Therefore, a start was made to equip the best machines with carbides

for the turning, facing and general machining of cast iron parts. Later, as carbide tools were perfected, they were adapted to the machining of steel. How far this program has been carried forward has already been indicated.

Today, turning and facing of cast iron with carbide tools is standard practice almost universally throughout the shop. Milling of cast iron is done with carbides on some 60 per cent of the jobs. This includes all the straight end-mill and face-mill work. The rest of the milling work is done with form cutters and even some of these have been changed over to carbides. So, too, are a good many of the boring mill jobs. The turning of all steel shafts, machined on a battery of Monarch Magnamatics and lathes with automatic-sizing controls, is done 100 per cent with carbide tools. Average run on these machines, which use a metal template for guiding the tool, is between 10 and 100 pieces.

Carbide tools have also replaced high-speed steel for finish chasing lead screws of all lengths. Carbides size better and keep the thread form and lead more accurate because of the lack of wear on the chasing tool. This is especially true on long screws. Because of the sharp angles necessary on this particular work, cutter wear has always been a serious problem on lead screw chasing. But carbides go a long way toward eliminating the problem, producing a more accurate screw with a better finish—and on fewer passes.

In changing over to carbides, experience has pointed out three fundamental principles that are all-important. They are:

- (1) Make sure that the machine has plenty of drive power,
- (2) Support the work rigidly, and
- (3) Support the tool rigidly so it won't chatter.

Such matters as speeds and feeds, cutting angles and chip control are all very important, to be sure. But until the problems of drive power, rigidity of work, and rigidity of the spindle are solved, there is no point in even thinking about the other matters.

Carbide tools, of course, cannot be stalled in the cut. It would seem only obvious then that input power of carbide tipped tooled machines should be built up to carry maximum loads. In the same way, since extreme rigidity is absolutely essential, it would seem obvious that both the work and the spindle should be rigidly supported. Yet all too often, it has been found, these relatively simple factors are



FIG. 2—Milling an apron casting with a carbide tool. Cutting speed = 250 ft. per min.; feed per min. = 14.50 in.; depth of cut = $5/32$ in.; size of carbide tipped cutter = 5 in.; cutting time per piece = 31 min.; former time using H.S.S. tools = 67 min.

overlooked in the quest for some seemingly difficult and obscure cause of failure.

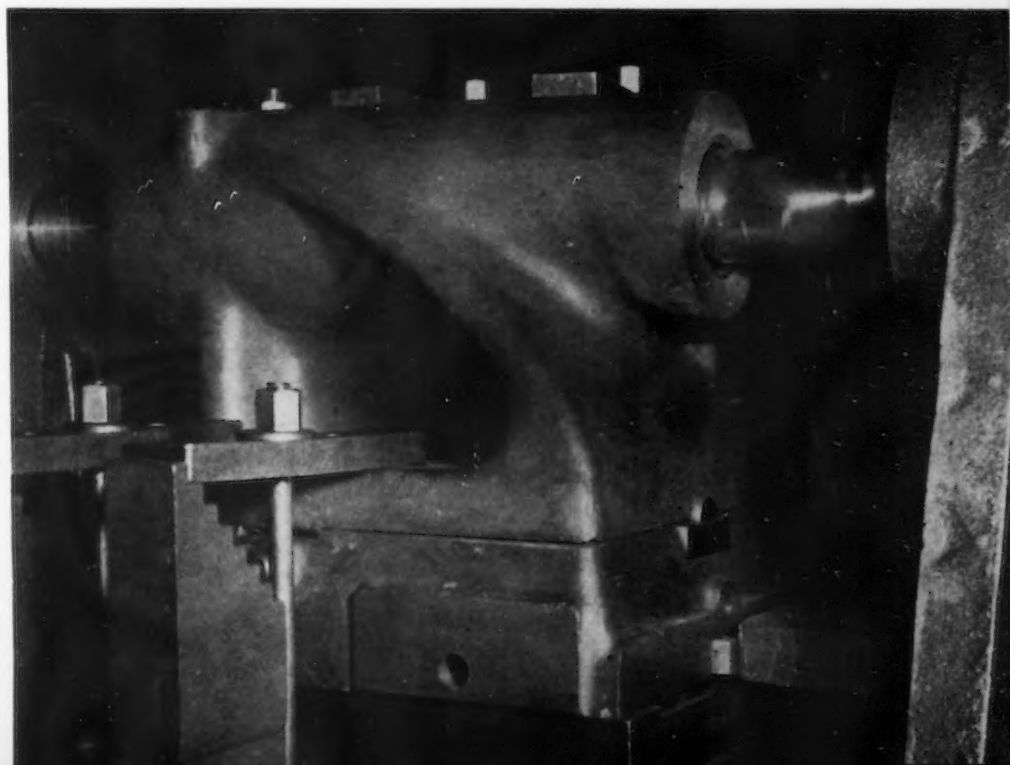
The three fundamental principles are illustrated in the jobs shown in the accompanying photographs. One is a steel job, the other two are cast iron. The first is a turning job, the second a milling machine job, and the third a boring mill job.

Fig. 1 shows the turning of a $3/4$ -in.

S.A.E. 2350 steel shaft. This job is run in lots of 50 pieces. First experiments with carbide tools on this job proved unsuccessful although set up on a fairly new machine. What was wrong? Not enough power in the main drive. The most important requirement in changing this job over to carbide was, simply enough, only sufficient input power to prevent the

(CONTINUED ON PAGE 86)

FIG. 3—Boring a 4-in. hole in a tailstock top with a carbide tool. Cutting speed = 108 ft. per min.; number of cuts = 4; feed on first cut = 0.007 in.; feed on second cut = 0.009 in.; feed on third and fourth cuts = 0.012 in.



What's New in Machine Tools

By FRANK J. OLIVER

Associate Editor, *The Iron Age*

REFINEMENTS in details, such as the addition of power rapid traverse to the table of a jig borer, characterize recent developments in machine tool design, as culled from announcements of the manufacturers received since the last review of this nature was published in the June 6 issue.

CLEEREMAN jig borers manufactured by *Cleereman Machine Tool Co.* and sold through *Bryant Machinery & Engineering Co.*, 400 W. Madison Street, Chicago, are now available with power rapid trav-

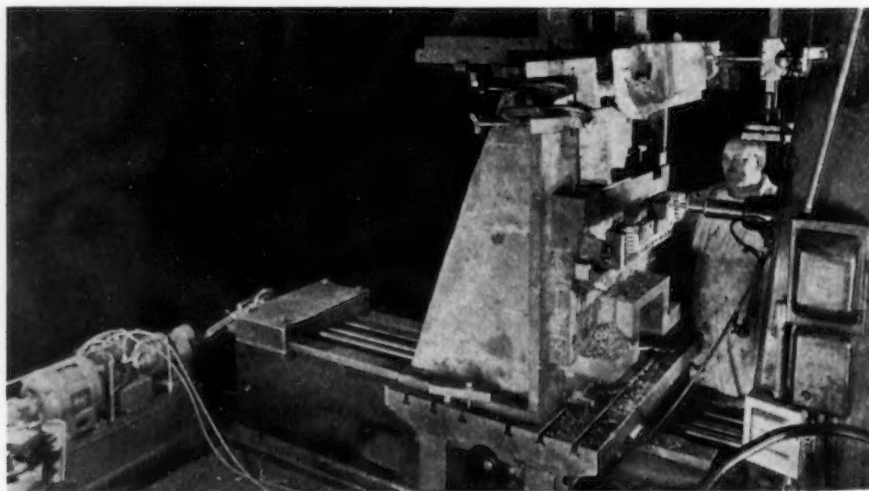
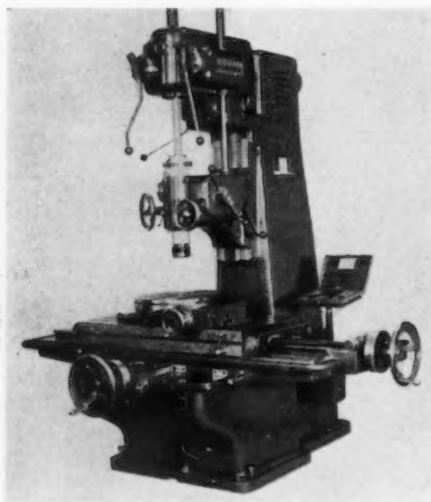
erse to the table and carriage. This consists essentially of a built-in motor which drives the screw through worm gearing, a small reversing drum switch used in conjunction with a magnetic reversing controller and limit switches to prevent over-travel. Power rapid traverse is available for either the longitudinal travel only or for both the longitudinal and transverse travel.

A two jaw clutch is employed for engaging either the power rapid traverse worm gear or the hand traverse handwheel. The fine feed handwheel, located on the end of the motor shaft, utilizes the same worm and gear as the power rapid traverse. With this construction it is possible to make rough settings by power and final adjustment of the table by the fine handwheel,

without touching the clutch. On machines fitted with end measuring rod equipment, one limit switch is built into the dial indicator housing to stop the rapid traverse motor just before the measuring rods contact the anvil of the dial indicator.

Duplicating Control on Boring Mill

APPLICATION of the duplicating unit made by the *Detroit Universal Duplicator Co.*, 233 St. Aubin Street, Detroit, to a standard horizontal boring mill has enabled die duplicating work to be handled by a regular boring mill operator without previous die duplicating experience. The control unit, which is connected with the longitudinal feed of the mill automatically governs the depth of cut from a

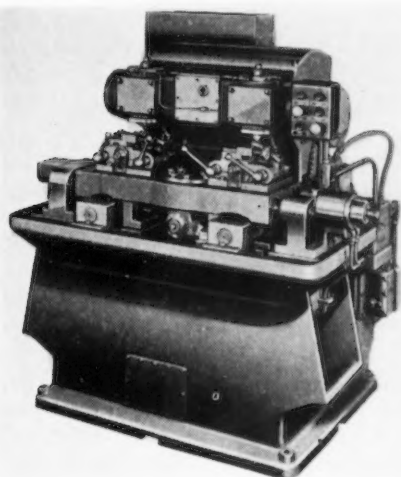


pattern and tracer head, while the vertical feed is fixed. The operator need only shift the table longitudinally after the completion of each cut.

Pattern is located above the work on a vertical fixture plate and the tracer head is mounted on the boring mill. When vertical feed is started, the tracer relays an interrupted series of electrical impulses to a solenoid controlled valve which governs the amount of oil delivered to a hydraulic motor for control of the longitudinal feed in conformance with the contours of the pattern.

Automatic Profiling Machine

TWO dimensional profiling to a tolerance limit of 0.002 in., either internal or external, flat or undercut, on parts having a profile pattern not larger than 6 x 8 in. by 2 in. thick, where the cut is $\frac{1}{8}$ in. deep or less on a face $\frac{3}{4}$ in. wide or less, can be performed in duplicate on the new Red Ring fully automatic profiling machine just announced by the *National Broach*



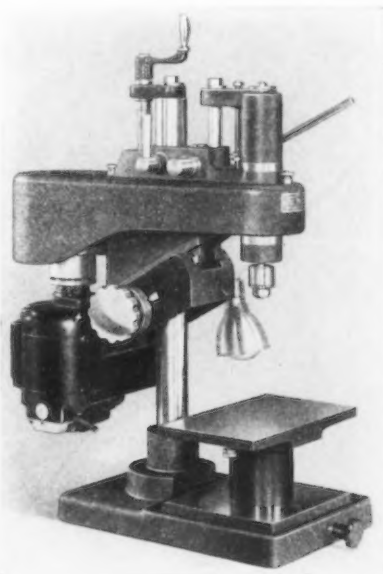
& Machine Co., Detroit. The principal field of application is in the manufacture of small arms parts and artillery breach mechanisms, aircraft engine parts, flat cams and other small components.

The work table carrying the two fixtures and on its underside the master pattern (exact size of finished piece) moves laterally and the spindle head moves at right angles to the former. Both movements are reversible and take place alternately by hydraulic power application. When the spindle head cylinder is working under feeding pressure, the table cylinder is working under holding pressure and vice versa. A guide pin integral with the spindle head traces around the master pattern and the two are maintained in contact by means of changes

from feeding to holding pressure from point to point in the path of the guide pin. To eliminate chatter, a closed hydraulic circuit with two pumps is used, one pump being used to actuate the pistons, the second to maintain pressure in the system.

Sensitive Drilling Machine

INFINITELY variable speeds from 840 to 9300 r.p.m., in two ranges, are available in the new Maxi-Vari-matic super-sensitive drilling machine made by the *Hamilton Tool Co.*, Ham-



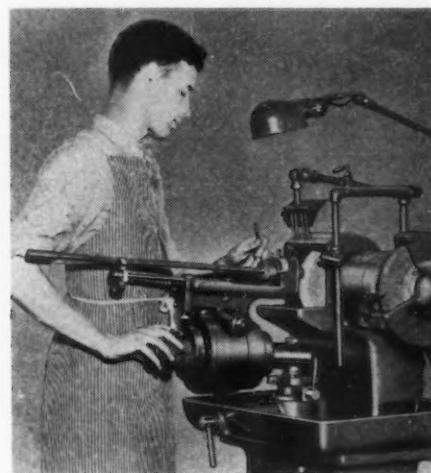
ilton, Ohio. A graduated dial on the speed changing handwheel shows the speed at which the spindle is operating. The drilling unit is self-contained and swings radially on the column. An elevating screw gives 6 $\frac{1}{2}$ in. of vertical adjustment to the head. Spindle pulley is carried on individual ball bearings and drives the spindle through a hardened key. Chuck spindle is suspended from rack link by a deep groove ball bearing. The 2 $\frac{1}{2}$ in. travel of chuck spindle is obtained through a universal ratchet and is controlled by adjustable stops. Drilling capacity is 0.004 in. to 5/16 in. in all drillable materials.

Deep Hole Drill Grinder

MAXIMUM efficiency in deep hole drilling operations cannot be obtained unless the drills are correctly sharpened as to the relief, clearance of the bevel and the flat, and smoothness of cutting edge. To produce such results, *Pratt & Whitney, Division Niles-Bement-Pond Co.*, West Hartford, Conn., has developed the deep hole drill sharpener shown. It is designed to sharpen drills from 3/16 to

$\frac{5}{8}$ in. Roughing and finishing grinding wheels are driven by a $\frac{1}{2}$ -hp. motor, while a $\frac{1}{6}$ -hp. motor mounted at the rear of the pedestal drives the coolant pump.

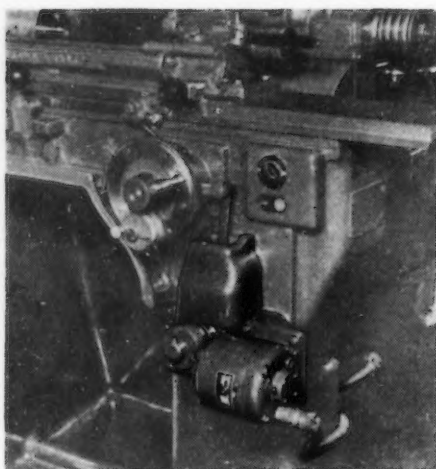
Drill is inserted in a drill bushing and cam which produces the correct helix and dwell positions. An adjusting nut feeds the rocker unit on which the cam is mounted toward or away from the grinding wheel on a radial, threaded arm. The arm swivels on a shaft which has vertical adjustment to obtain the desired relief at the cutting edge. The amount of swivel is read on a graduated dial. By means of a worm and fixed worm wheel, the rocker housing is swung about the radial, threaded arm, giving sidewise feed and also enabling the drill to be shifted from roughing to finishing wheel. Provision for step grinding is available. Stepping the drill splits the chips and facilitates their passage through the



chip groove in the shank, besides giving smoother holes and longer drill life.

Plunge Cut Grinder Attachment

AUTOMATIC plunge cut grinding may be performed on the *Brown & Sharpe No. 5* plain grinding machine by means of an independent automatic cross feed arrangement, just announced by the *Brown & Sharpe Mfg. Co.* With it, 172 straight infeeds are available in steps of quarter thousandths. A separately controlled 1/20-hp. gearhead motor is used to drive a variable radius crank mechanism mounted below a similar unit which is regularly used to operate the cross feed pick mechanism upon table reversal. From the cross feed pawl arm there is dropped a new vertical link which may be connected to either of the two crank mechanisms through an



interchangeable stud and bushing. The amount of feed per pick of the pawl is selected by means of a pointer and scale on the particular rotating member in use. This arrangement must be applied to the machine at the factory.

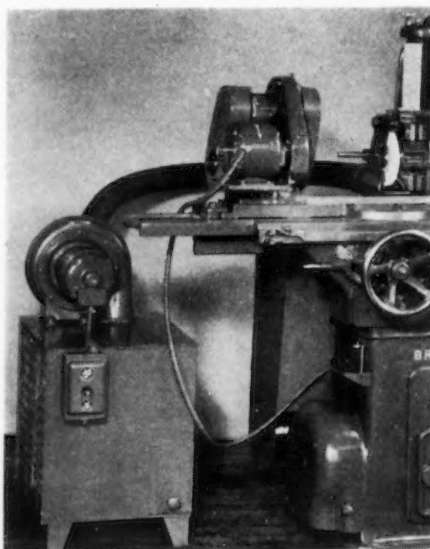
Knife and Shear Blade Grinder

SHEAR blades or beveled knives such as planer and scraper blades, as well as nearly all straight knives in general use, can be ground in the new Seybold knife grinders, supplied by the *Harris-Seybold-Potter Co.*, Dayton, Ohio. Unique feature is a hollow, three-sided knife bar, each surface presenting a different angle to the traveling grinding wheel. A fourth, open side simplifies bolting or clamping various blades to the bar. A variety of shear blades can be accommodated up to 6 in. width. Grinding wheel feed is automatic and coolant is supplied by a centrifugal pump. All gears and clutch parts operate in an oil bath. Adjustments and controls are said to be simple so that an experienced oper-

ator is not required. This grinder is made in three standard sizes, 70, 100 and 128 in. The 100-in. size is illustrated.

Grinder Exhaust Attachment

BROWN & SHARPE MFG. CO. is now supplying an exhaust attachment for its No. 13 universal and tool grinding machine. The device includes an exhaust nozzle, flexible wire reinforced suction hose and a dust collecting unit consisting of a motor driven fan mounted on a separator tank. The grit laden air is blown into

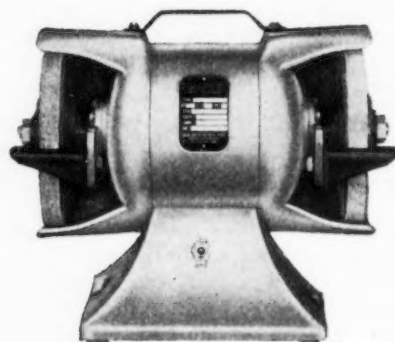


a spiral separator where the heavier particles are removed by centrifugal force and is then spread by a baffle into an expansion chamber where it is slowly dispersed over the outlet filter, made up of fire resistant, viscous coated filter pads enclosed by metal grilles. Attachment with a 3600 r.p.m.

$\frac{1}{4}$ -hp. motor has a capacity of 300 cu. ft. per min., giving a velocity of 6000 ft. per min. through a 3 in. diameter hose. The nozzle can be used at either end of spindle.

Bench Grinders

TWO new sizes of bench grinders have been introduced by the *Baldor Electric Co.*, 4357 Duncan

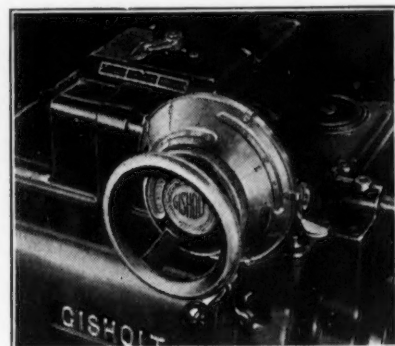
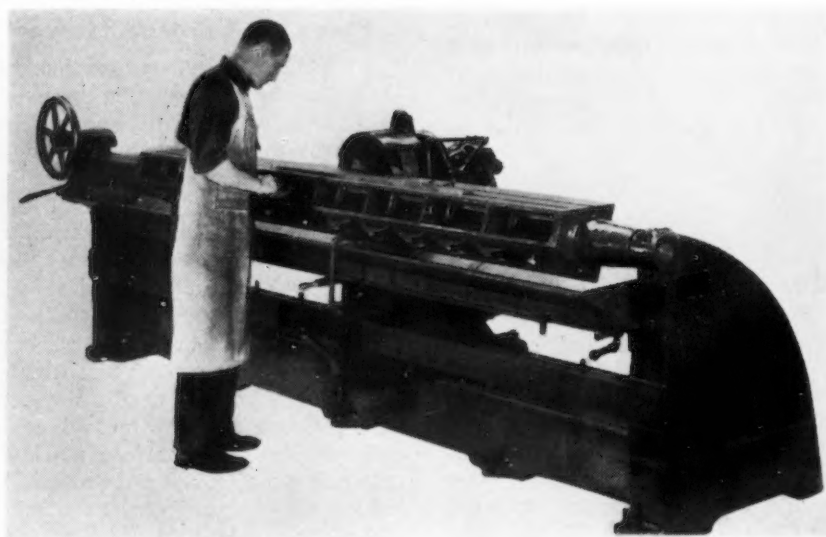


Avenue, St. Louis. The No. 60 grinder, illustrated, is a ball bearing machine carrying 6 x $\frac{5}{8}$ in. wheels and driven by a capacitor type motor, which it is claimed will not burn out even though repeatedly overloaded. The single phase motor is rated at $\frac{1}{4}$ hp. at 3440 r.p.m.

The No. 724 grinder is designated as a deluxe 7 in. model. It is powered with a $\frac{1}{2}$ -hp., 3400 r.p.m. capacitor motor and is equipped with 7 x 1 in. Aloxite wheels. The particular feature of this ball bearing grinder is the shatterproof glass eye shields which accommodate a tubular light that illuminates both sides of the wheel. Other features include spark breakers, a water pot attached to the grinder and a tool rest which is adjustable to and from the wheel, up and down, and at any angle.

Speed Selector for Turret Lathes

THE Gisholt speed selector originally furnished for use with ram type turret lathes is now available for the line of high production turret



lathes made by the *Gisholt Machine Co.*, 1215 E. Washington Avenue, Madison, Wis. By turning the speed selector dial to the graduation corresponding to the diameter of the work, the machine automatically shifts to the spindle speed producing the correct cutting speed for that diameter. Direct, preset or high-low operating control is possible. The change in speeds is accomplished without slowing down the machine and is performed by power.

Toolroom Bench Lathe

THE new 10-in. swing, 1-in. collet capacity series S toolroom bench lathe recently announced by the *South Bend Lathe Works*, South Bend, Ind., is mounted on a sturdy tubular steel bench, giving the unit the stability of a floor type lathe. The machine is made in 3, 3½, 4 and 4½ ft. bed

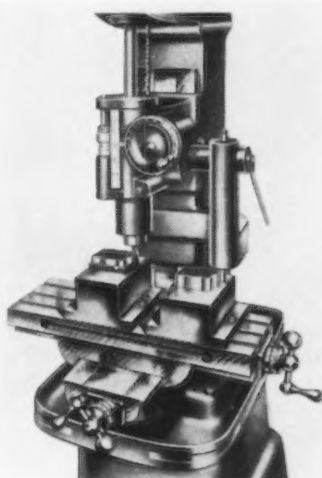


lengths. Twelve spindle speeds ranging from 50 to 1357 r.p.m. are provided by standard motor equipment and direct belt drive to a cone pulley. Motor and driving mechanism are mounted under the headstock in the left end of the bench. Power longitudinal carriage feeds, power cross feeds and a series of 48 right and left hand screw threads are provided. Bearings for the headstock spindle are unusually large and the spindle journals are superfinished to a smoothness of 5 micro in.

Carriage is heavily constructed with long bearing surfaces on the bed ways. Apron is of the one piece double wall type. Power carriage feeds are operated by a worm drive and a series of precision cut steel gears, controlled by a multiple disk clutch. A telescopic taper attachment is standard equipment on this lathe.

Profiling Attachment for Vertical Miller

ESPECIALLY developed for small lot machining of irregularly shaped forgings, but also applicable to



contour milling from wood, plaster or plastic models is a new form of profiling attachment for the Vernon combination vertical mill and jig borer, made by the *Machinery Mfg. Co.*, P. O. Box 155, Vernon Branch, Los Angeles. The sliding head of the tool is so constructed that this attachment can be readily engaged and disengaged. It is said to provide easy operation and provide an inexpensive attachment for duplication from patterns for a wide variety of mold and die work within its range.

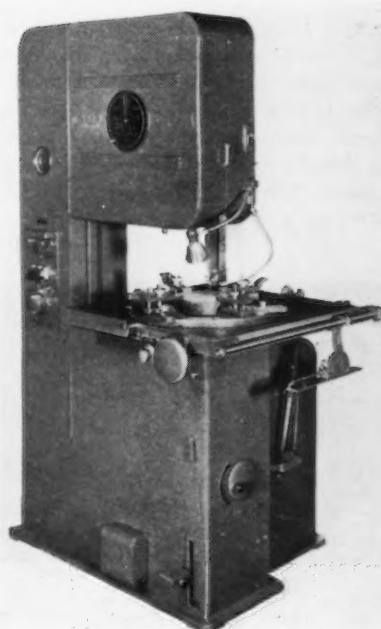
Hydraulic Metal Saw

PERFORMANCE figures on a new Peerless 6 x 6 in. high duty hydraulic metal saw indicate the production possibilities of multiple cutting in a machine equipped with hydraulically operated bar feed, an automatic multiple vise, special automatic length gage, automatic stock support and stock chute. In the set-up pictured, 16 bars of 1½ in. diameter SAE 1010 steel were cut at 100 ft. per min. and feed

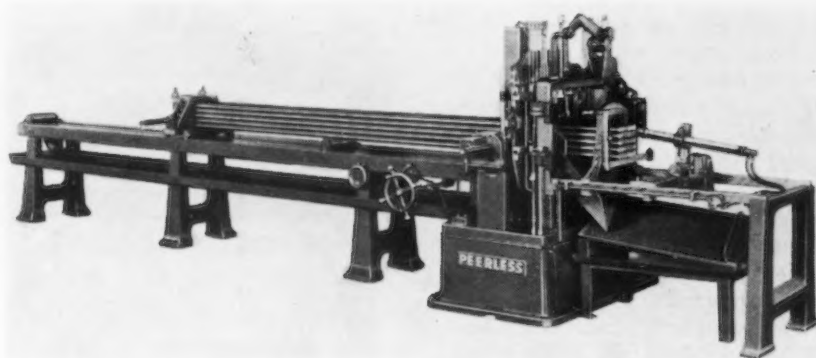
pressure of 160 lb., using a 6-tooth, high-speed steel hack saw blade. The first cut of the 16 bars was made in 6.5 min. and the cut was parallel within 0.005 in. The 82nd cut was made in 6.65 min. with the same accuracy. Altogether 1312 pieces were cut with the same blade at the rate of about 3.7 sq. in. of stock removal per min. or a total of 1955 sq. in. of stock removal for one blade. In these machines, the conveyor is equipped with a heavy sheet metal coolant drip pan for its full length and the special stock chute also has a sheet metal coolant drip pan.

Contour Sawing Machine

MECHANICAL control of the curvature of the cut by means of a handwheel is a feature of the



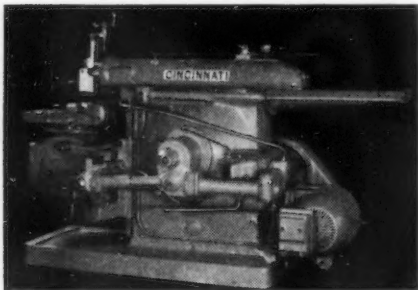
workfeed of a new model contour sawing machine, termed the Super Doall, recently announced by *Continental Machines, Inc.*, Minneapolis. The feed eliminates hand guiding on the part of the operator. This model accommo-



dates band saws up to 1 in. wide as well as narrow saws. Guides have been improved and they are adjustable for any thickness of band used. There is also an assortment of 21 file bands available in three widths, $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{1}{2}$ in.; also three abrasive polishing bands. Drive is by a $1\frac{1}{2}$ -hp. motor controlled by push button and provided with overload protection. The transmission has helical steel gears. Speed changes are made through Speed-master pulleys which have been used on other Doall models. The 26-in. wheels of this model are made of cast aluminum with recessed neoprene tires. This model is furnished with cut-off and mitering attachment, automatic disk cutting attachment, rip fence, table tilt compensator, and automatic butt welder and weld grinder.

Shaper Improvements

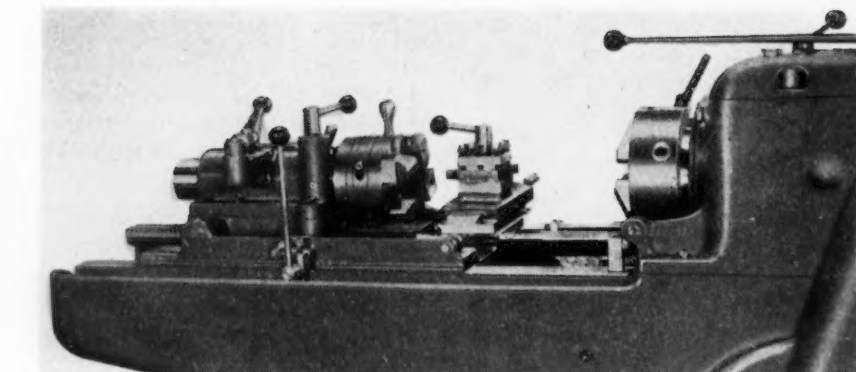
RAIL clamping, also rail elevating and lowering controls are now conveniently located on the operator's side of Cincinnati power rapid traverse shapers, manufactured by the *Cincinnati Shaper Co.*, Hopple, Elam and Garrard, Cincinnati. Such controls are shown applied to a 24-in. universal



shaper. Other improvements made to the line include a redesigned automatic oiling system with additional reservoirs; neoprene rubber wipers for ram and rail bearings to provide more efficient retention of oil and added protection of bearing surfaces; and larger dials and indicators, chromium plated for easier reading.

Special Threading Machine

UNUSUAL arrangements have been made on a Landmaco threading machine by the *Landis Machine Co.*, Waynesboro, Pa., to make it adaptable for threading rock bit steel or rods. The machine pictured employs a three-jawed universal chuck on the machine spindle instead of the conventional Lanco revolving type head. The die head is mounted on a special carriage equipped with a tailstock into which an extra long shank of a Landmatic head is fitted. A lever is pro-

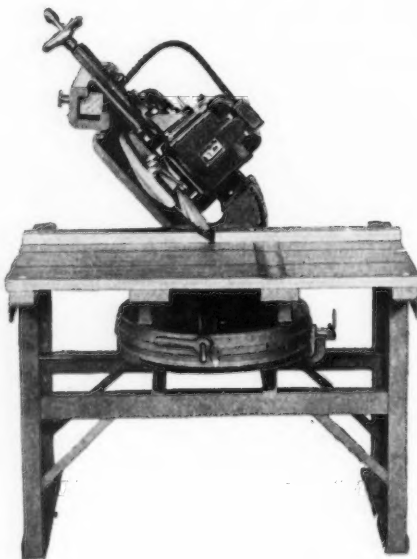


vided to extend the die head to its most advanced position in the tailstock, where it is clamped for threading operations. All threading operations are accomplished by lead screw.

Directly in front of the die head on the carriage is a cross slide supporting a square turret which can be fitted with turning, facing, forming and cutting off tools. A quick acting clamp is provided to lock the entire carriage assembly in position during cutting off operations.

Woodworking Saw

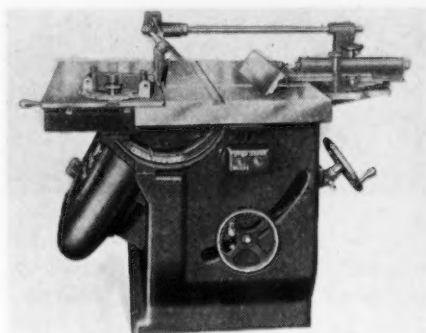
A STATIONARY table Junior model, X-36B, has been added to the line of Monarch Uni-Point radial saws, made by the *American Saw Mill Machinery Co.*, Hackettstown, N. J. This new model retains the basic Uni-Point principle by which on all cross cut angles the saw blade always enters the work at the same point on the table. On this new Junior model, the column revolves to the left 70 deg., permitting cutting angles as small as 20 deg. The wooden fence can be removed, greatly increasing the ripping capacity for wide ripping on lumber up to 3 in. thick. The conventional



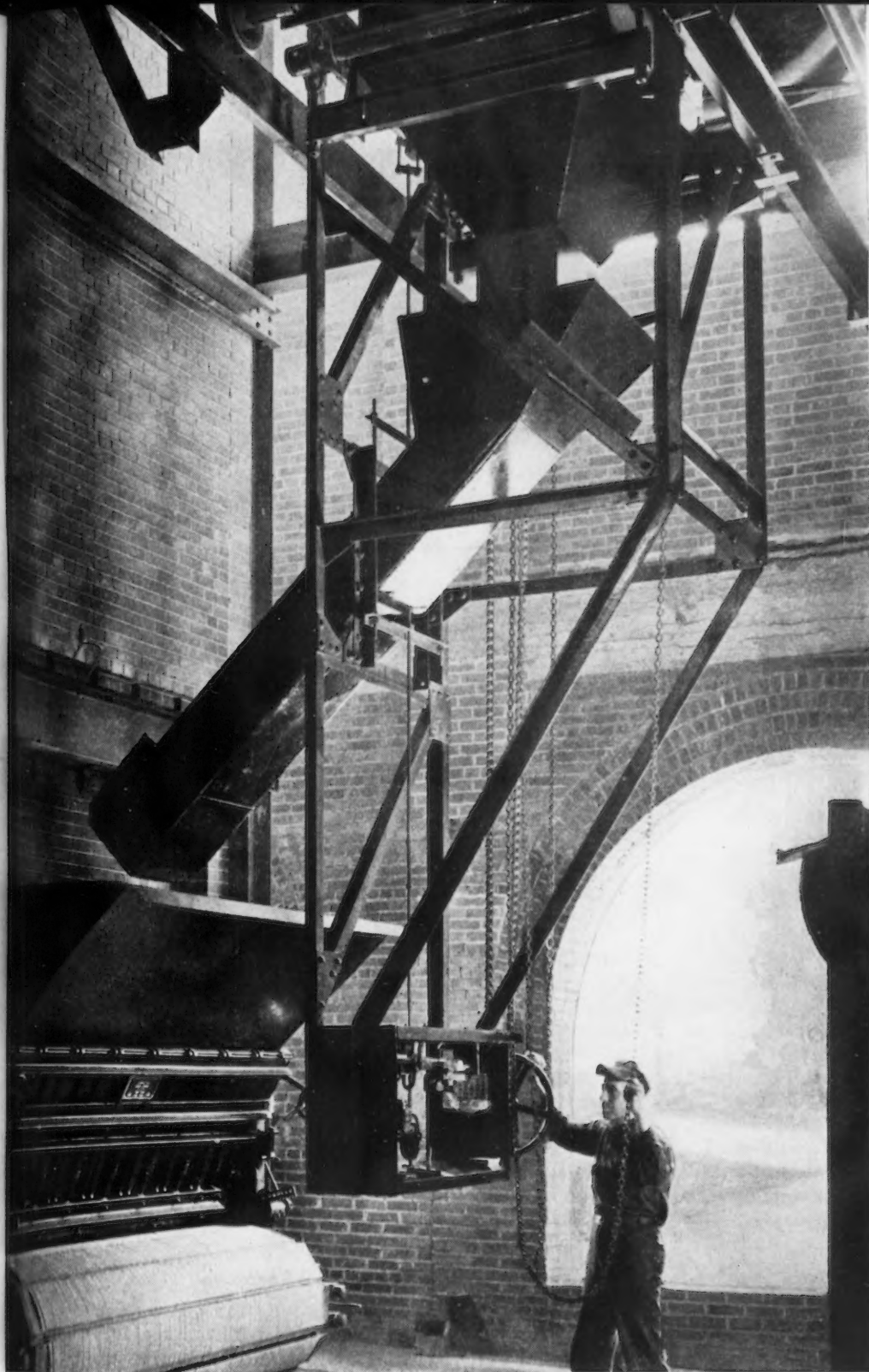
bench type table is 44 in. long and the unit is mounted on a welded steel frame. These Junior units can be equipped with motors up to 3 hp. Motor arbor and saw are carried on a telescoping overarm which readily slides on roller bearings. The machine is completely universal and besides doing all types of sawing at any angle, will perform jointing, sanding, dadoing, rabbitting, routing, and shaping operations.

Tilting Saw Bench

TWO saw arbors, one carrying a 16-in. rip saw, the other a 16-in. cross cut saw, each driven by built-in 5-hp. motors on arbors, are found on



the No. 260 double arbor universal saw, designed by the *Oliver Machinery Co.*, Grand Rapids, Mich., for the larger engineering institutions and pattern shops. Either saw can be brought into operation by turning a handwheel at the front of the machine. The two ball bearing arbors are carried in a yoke which can be tilted up to 45 deg. Table is composed of a stationary and a rolling section. The rolling section, carried on ball bearings, may be moved 4 in. from the saw, permitting the use of dado heads. A miter cut-off gage is supplied for use on the rolling table for cutting wide stock at angles from 30 to 135 deg. Universal gages, operating in table grooves, are also supplied, as well as a universal saw guard.



Hopper and Chute of Coal Weigh Larry at Neuweiler Brewery, Allentown, Pa. Built of "A.W." Dyn-el High Strength Steel by Beaumont Birch Co., Philadelphia. Also included in the company's coal conveying equipment is an enclosed Bucket Elevator, with Buckets made of "A.W." Dyn-el High Strength Steel

▲
Typical physical properties of "A.W." Dyn-el High Strength Steel: Tensile Strength—72,000 lbs. per sq. in.; Elastic Limit—58,000 lbs. per sq. in.

They had to fight corrosion . . . To withstand the severe corrosive action of Steam Anthracite Coal, the builders of the coal conveying equipment in the modern Neuweiler Brewery selected "A.W." Dyn-el. This new high-strength steel is 60% to 150% more resistant to corrosion than copper-bearing steel (4 to 6 times ordinary steel). It resists premature failure by fatigue, resists abrasion and reduces weight far below conventional construction. "A.W." Dyn-el High Strength Steel is the first choice of steel buyers for highly stressed parts in structures and mobile equipment of all kinds.

The 48-page book, "A.W." Presents Dyn-el, gives full details of savings in weight and cost possible with this new high-strength, flat-rolled steel. Write for a copy.

ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS, CONSHOHOCKEN, PENNA. : : SINCE 1826 : : DISTRICT OFFICES AND REPRESENTATIVES—Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, New Orleans, St. Paul, Pittsburgh, Roanoke, Sanford, N.C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal—A. C. Leslie & Co. PRODUCTS INCLUDE—Steel Products in Carbon, Copper or Alloy Analyses : : Sheared Steel Plates : : Hot Rolled Sheets and Strip : : "A.W." Rolled Steel Floor Plates : : Billets, Blooms and Slabs : : "Swede" Pig Iron : : Reading Cut Nails.

DETROIT—Today's worldwide interest in prospects that the automobile industry may become a predominant factor in building airplanes and high-powered aircraft engines is going to mark an important step in the education of men generally, and in other industries particularly, to a proper appreciation of the term "mass production." The resulting dissemination of basic ideas that *precede* the assembly line probably will have a salutatory effect.

A probable benefit lies in the eventual education of consumers so they will have a better understanding of the economics upon which most of our civilization is built. Possibly in the period of tooling up for record-shattering production of war materials, there will come a better understanding of the machine and its place, working for men; productivity may again become an industrial virtue. And, paradoxically, when tax monies go into tooling programs for mass production of goods for war, the man on the street may gain greater understanding of the economics of the peace-time use of "labor-saving" equipment.

Such broad education is already under way, and industry has not directly sponsored it. Spurred by allegations that the defense program has bogged down, there have been official (Washington) acknowledgments and numerous newspaper discussions in the last week of the time element requisite for tooling for mass production. Already a clearer understanding of the subject has been fostered.

The distinction between final assembly methods of auto plants and the term "mass production" was made clear recently by C. E. Wilson, who stepped into William S. Knudsen's shoes at General Motors when Mr. Knudsen became a member of the National Defense Committee.

"The symbol of the conveyor line is the obvious thing that the average person takes as representing mass production, but that really isn't the basic thing of mass production," the acting president of GM said.

"The basic thing is really an interchangeability of parts and flow of material. It doesn't have to be on a conveyor at all. That has nothing to do with it really. But it is a balancing of your equipment in your plant, and a flow of parts that are interchangeable and inspected and qualified, so that you can proceed with the production."

The Time Element in Tooling

IMMEDIATE interest is focused on the time element in tooling according to prevailing automotive standards. The American automobile industry, which has

On The Assembly Line

BY W. F. SHERMAN

Detroit Editor

• Difficulties which the automobile industry may experience in developing mass production for the defense program are now becoming better understood . . . The time element required for new jobs is a factor to be reckoned with

produced 85 per cent of the world's 95,000,000 cars and trucks in the past 40 years, has a reputation for working miracles—and the reputation does not rest easily on the industry. An unusually well informed man in the industry declared last week: "Like the definition of genius—nine-tenths perspiration and one-tenth inspiration—the motor industry's miracles have been based mostly on long-time planning, timing, coordination and hard work, rather than any supernatural powers which enable several tons of raw materials to be converted overnight into a slick, efficient motor car."

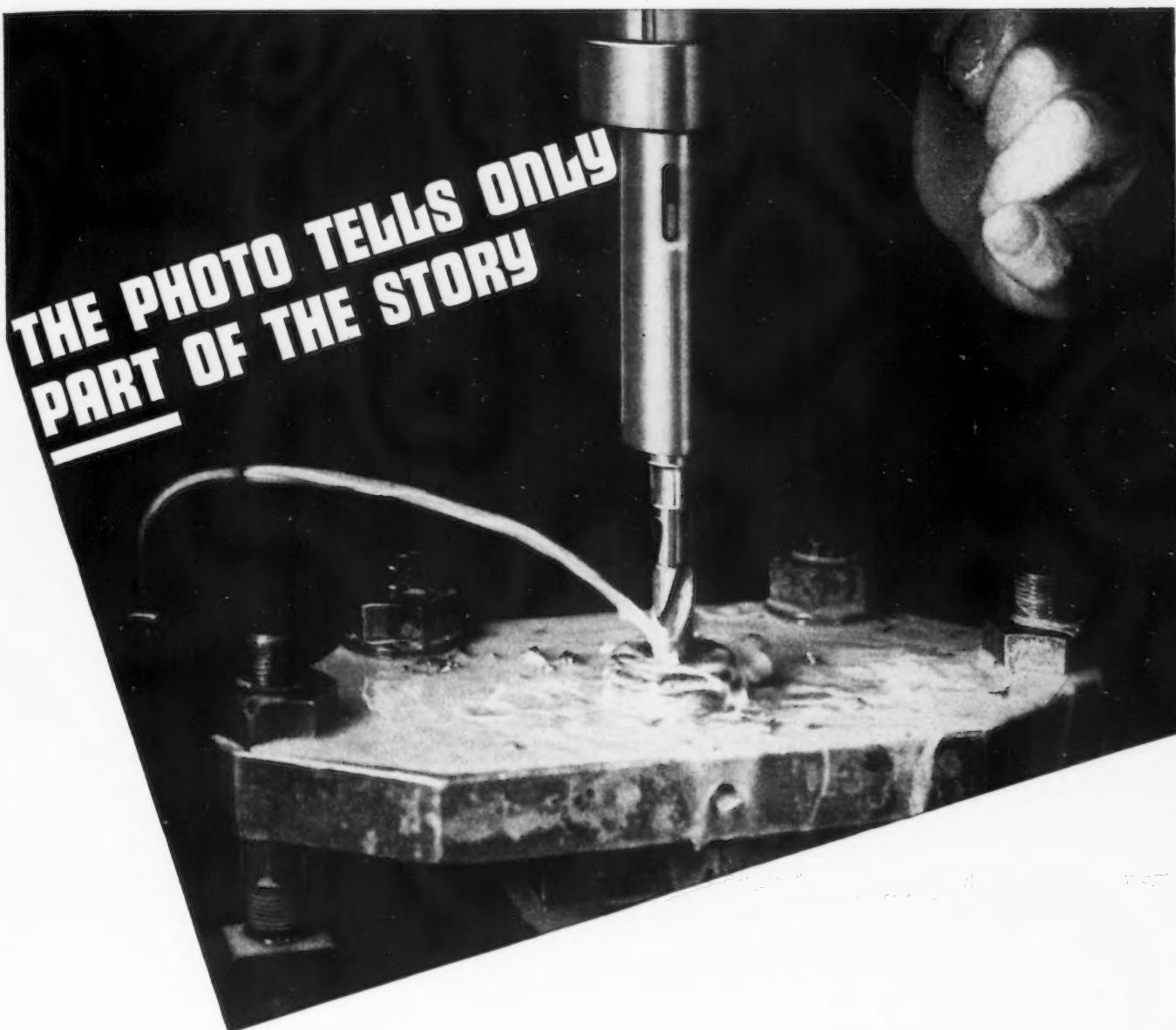
It takes time even to make rather slight changes in mass-produced units. In the year-to-year development of the new cars displayed at the Na-

tional Automobile Show, the changes are being worked on for 10 months or a year before introduction to the public. Drawing a parallel which might fit the engine, plane and tank programs being discussed today, to give an idea of the procedure that must be followed, it is worth noting that activities in the first few weeks of each new automotive program are confined to a relatively small number of technicians and engineers. But six to nine months before the new models are out, thousands of skilled workers concentrate solely on making tools, dies, jigs and fixtures for the new models. And six weeks or more before the new cars are first assembled on conveyors, parts plants are making parts and sub-assemblies.

New Model Planning a Long Job

THERE are cases where planning for a new model began years, not mere months, before actual production got under way. Time was needed to iron out flaws in experimental models, to design and build special equipment to do new jobs, and then to arrange all productive facilities to turn out the work as desired. In any defense program, the industry should be able to count on receiving finished designs, ready for production tooling; it cannot cope quickly with new, incompletely drafted plans which would be subject to changes before production could get under way. It is already evident, however, that such a job may be foisted on it. The design of one huge piece of defensive equipment, a tank, has been pushed along through preliminary tooling stages apparently without certainty that some of the important driving units are strong enough to transmit power required in service. If this is true, and there is evidence that it is, the project is not ripe for action by the production departments of the auto industry.

**THE PHOTO TELLS ONLY
PART OF THE STORY**



● Action photography caught this stream of coolant right in "mid-stream," so to speak. It even "stopped" the drill which was churning in at a speed of over 500 R. P. M.

But the photo does *not* show the study that a G. T. D. Greenfield engineer put into this particular job. It does *not* show long discussions of jig design. It does *not* show a number of tests made to determine the best speed to drill the particular alloy steel used in the part for which this jig was designed. It does not and cannot show the cooperation which "Greenfield" sales engineers give to every "Greenfield" customer, large or small, to enable him to get only the best out of his "Greenfield" tools—to get more production at less cost than from any other tools he can buy anywhere. And because G. T. D. Greenfield is a large, experienced concern, "Greenfield" is able to furnish this type of service at no extra cost.

So, when you look at this photograph, remember that what it does *not* show is far more important than what the camera caught.

Greenfield Tap & Die Corporation • Greenfield, Mass.

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TAPS • DIES • GAGES • TWIST DRILLS • REAMERS • SCREW PLATES • PIPE TOOLS

The usefulness and productive-ness of specialized machines used in mass production depend on the job — the operations — remaining the same. If the dimensions of a cylinder block, or transmission case or gears or the size of a crankshaft are altered materially, then no longer are these machines capable of doing their job. When major model changes are decided upon, literally thousands of machines are rendered obsolete overnight. Rebuilding may restore the machine to service, depending on how extensive the changes are, but mass production is at least delayed.

Moreover, as every industrialist knows, almost every operation in an auto plant is synchronized with other operations; therefore, when a major change is ordered in one part, the whole character of work in other parts of the plant may be changed and an upheaval of equipment in many departments ensues. This is disturbance of the "balancing of equipment and the flow of interchangeable parts" which is costly and provocative of delays fatal to the mass production principle.

One of Wilson's precepts, handed down in his first interview after taking over the reins at GM, was that the auto industry should restrict itself in the defense program to "making things that run on wheels." This is the viewpoint of many high in the industry, and they point to some of the vital differences between airplanes and automobiles, from the production standpoint.

The automobile engine on the average develops less than 100 hp.; the type of plane most needed by the United States must develop at least 1000 hp. Experience on low-powered engines is analogous to experience required to build high-output power plants, certainly; but not completely so.

The automobile engine can weigh five pounds per horsepower; the plane engine just one pound per horsepower.

It costs \$1 per horsepower to make an automobile engine; \$10 per horsepower for the plane engine.

Because of requirements that aircraft parts be machine-finished on all surfaces and generally polished, it requires (conservatively) three times as much work to finish the crankshaft, connecting rods and other parts of the airplane engine and accessories as it does corresponding parts of the automobile.

The size of the cylinder bore of the automobile is about 4 in.; that of the airplane about 6 in. One comment on this point is of interest: "If our job was just to change from machining an automotive cylinder block to a block large enough for a cast-en-bloc airplane engine, the increase in size and spacing of the bores would mean junking all multiple-spindle boring and drilling equipment on the job.

Should Start From Scratch

MASTER mechanics are of the general opinion that time and money could be saved by starting out from scratch with new equipment in all phases of an airplane engine manufacturing pro-

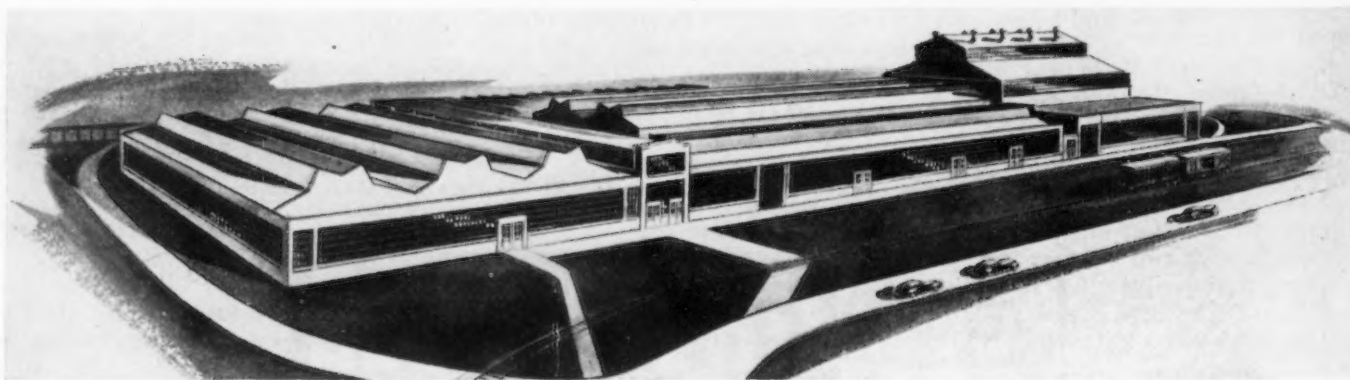
gram. Knowing that it takes a full year to accomplish most automotive tooling programs (it has taken a whole year for one of the major manufacturers to get delivery on enough new gear-cutting equipment to change types of rear axles) they are urging that wishful thinking on the subject should be geared down to the facts. Until the equipment is installed in the plants and ready to operate, they remind us, no production miracles can be anticipated.

This realistic approach holds for the industry as a whole, but does not take into account the individual cases where companies have been carrying on aviation work outside their regular automotive activities. How quickly any manufacturer can swing into production on engines, planes or tanks or other articles needed for defense purposes depends greatly on what is his starting position in the race.

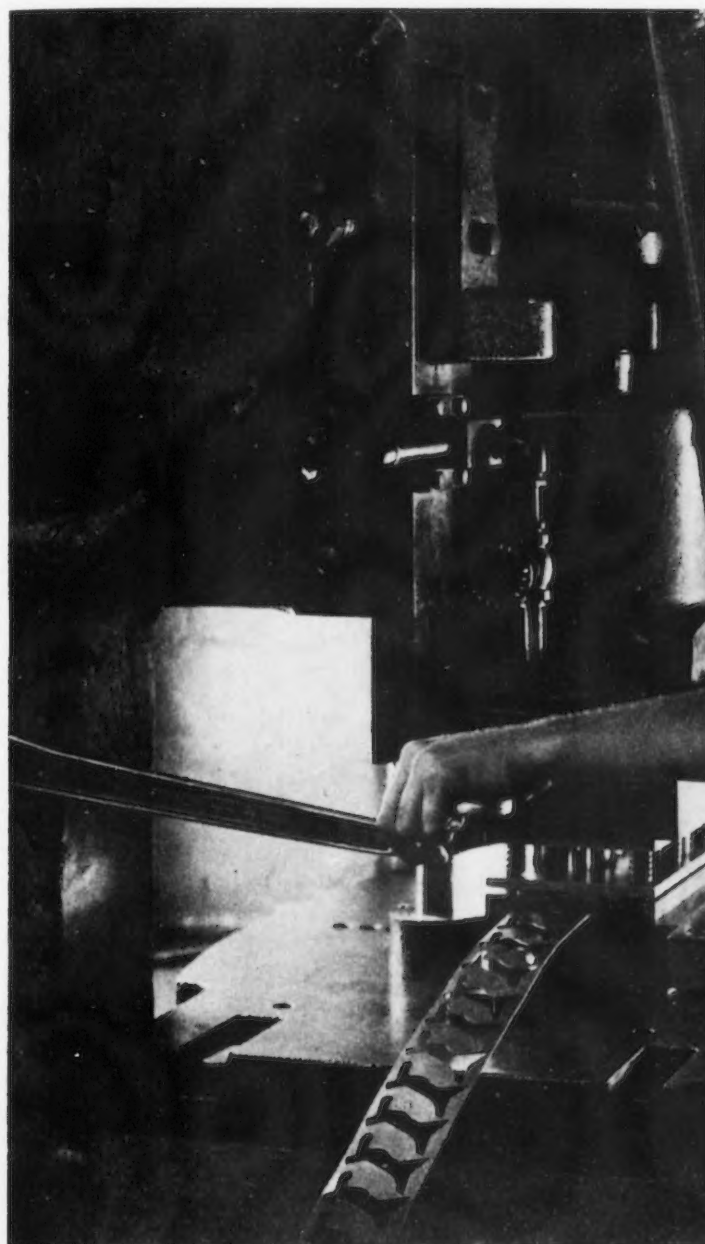
Automobile production for the past week dropped below the corresponding level of 1939 model output for the first time since last winter, and the industry appears headed for a quick changeover to 1941 models. Output for the week just ended was 62,176 passenger cars and trucks compared with 51,975 in the July Fourth holiday week, according to Ward's Automotive reports. The total is more than 1700 below the 63,910 produced in the comparative 1939 week.

Since the bulge in production began last December, after the Chrysler strike, 1940 output has been consistently above the 1939 level. Retail sales of new and used cars are at an unusually fast rate, contrary to seasonal expectations, and the cleanup of new car inventories is proceeding at a pace that indicates that no difficulties will be encountered in introducing 1941 models on schedule.

THE FIRST automobile plant devoted mainly to forging press work is shown in this architect's drawing of the new Oldsmobile heavy press metals division building in Lansing, Mich. The building is to be 600 ft. long and the right wing, when completed, will be 160 ft. long and 120 ft. wide. The property, recently purchased by Oldsmobile, was formerly known as the Ryan-Bohn Foundry. When completed it will be used to manufacture crankshafts and other forged parts.



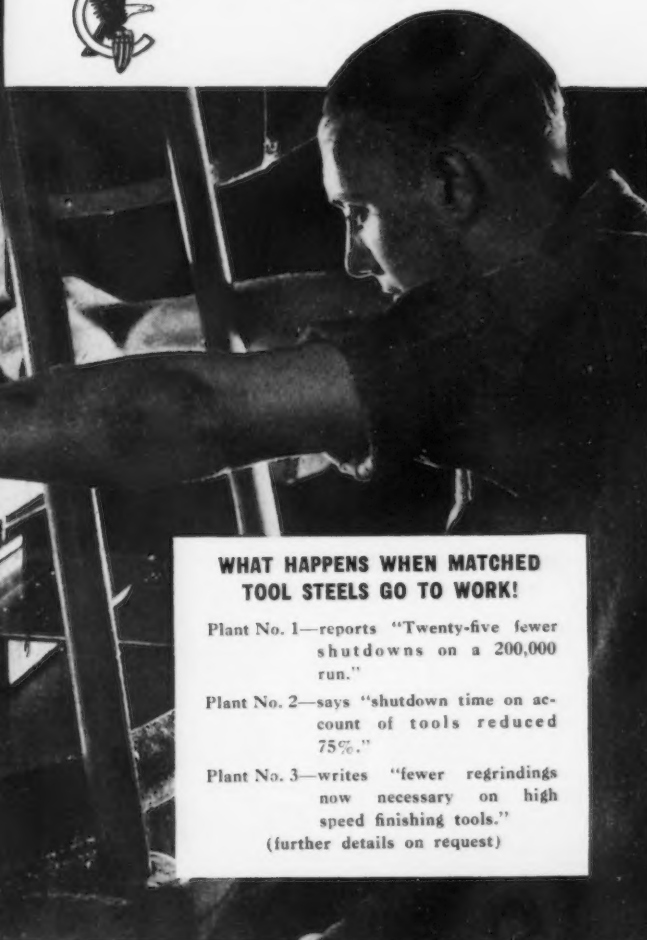
More **RUNNING** time— less **SHUTDOWN** time!



EVERY production man knows the secret of lower costs is more *running* time and less shutdown time. When a press must be shut down to regrind or replace tools that have fallen short of the job—valuable running time is lost—and idle time of press and operator eats into profits.

Frequent interruptions of this kind not only jack up costs, but they upset production schedules all along the line. If you are looking for new ways to reduce costs and increase output per machine—check your tools and dies now. Carpenter Matched Tool Steels make possible *improved* tool performance that allows more *running* time. More and more plants are discovering that these tool steels definitely increase output per machine by reducing shutdown time. Find out what other plants are saving on specific jobs. Send the coupon below for a new illustrated booklet just issued. It shows how to get similar savings in your plant.

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Plant No. 1—reports "Twenty-five fewer shutdowns on a 200,000 run."

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WASHINGTON—Agreement between the White House and leaders in Congress on a 5-year amortization formula is expected to break down a formidable obstacle which has delayed expansion of national defense industrial facilities. Once it is written into law the plan, to be incorporated into the forthcoming excess profits tax law, steel and other interests are expected to proceed with the construction of new or expansion of present plant capacity, which is of value only in times of national emergency. In this category is increased capacity for making armor plate, ranging from the smaller to the larger sizes, for battleships, cruisers, tanks, anti-aircraft guns and many other items.

Participating prominently in the plan, which heretofore has been balked by opposition within the administration, particularly from the Treasury Department and the "leftist" element, were Edward R. Stettinius, Jr., and William S. Knudsen of the National Defense Advisory Commission. It long has been no secret that failure to determine specific industrial charge-offs has blocked development of facilities. An outstanding example has been the delay in reaching an agreement on the production of Rolls-Royce airplanes for the United States and Great Britain.

Delay of Passage Until August Possible

DESPITE the decision on a formula, however, its incorporation in law probably will be delayed until the latter part of August or the fore part of September. This view is based on the belief that the passage of the tax legislation will require a month or more after Congress reconvenes on July 22 following the present recess owing to the Democratic convention.

Announcement of the formula was made on Wednesday of last week by Stephen T. Early, secretary to the President. The announcement followed a conference the President held "with the view of adjusting the defense program to the existing and proposed excess profits tax structures." Those he conferred with were Secretary of the Treasury Morgenthau, Assistant Secretary of the Treasury Sullivan, Senator Pat Harrison, Chairman of the Finance Committee, Representative Jere Cooper, Chairman of the Subcommittee on Internal Revenue Taxation of the House Committee on Ways and Means, Mr. Knudsen, and Federal Loan Administrator Jesse Jones.

"It was unanimously agreed by those attending that the excess profits tax bill soon to be introduced will and a tax of 65 per cent on a return over that amount.

Washington

BY L.W. MOFFETT

Washington Editor

• Agreement on 5-year amortization for plants making defense equipment may remove one of program's biggest obstacles . . . Legislation will speed ordnance contracts . . . Excess profits tax to be applied to all industries

year period of additional facilities, including both plant and equipment, certified as immediately necessary for national defense purposes by the Army and Navy and Advisory Commission of the National Defense Council," the statement said.

"It also was unanimously agreed that the proposed excess profits tax bill, which will apply generally to all industries, will be substituted for the excess profits provisions of the Vinson-Trammell Act which now apply only to army and navy aircraft and naval vessels.

"The contemplated action is expected not only to simplify the multiple tax problems of prospective contractors but to greatly clarify their future tax liabilities.

"In this manner, any doubts as to the tax position of contractors in

the general program of national rearmament will be removed and they will be able quickly to execute defense contracts.

"The conferees were agreed that the plan is certain to result in an appreciable acceleration of the national defense program. At the same time it is intended that there be no substantial sacrifice of revenues accruing to the United States Treasury."

Undue Profits Will Be Recovered

REFERENCE to no "substantial sacrifice" of Treasury revenues apparently is an expression of the administration's declaration against "war millionaires" and the implication seems plain that any undue profits will be recovered through an excess profits levy.

The plan to adopt an excess profits tax, to be applicable to all industries, regardless of whether they are engaged on government or private work, followed an agreement to drop the profits limitations of 7 and 8 per cent on aircraft and naval ship construction.

Looking to the drafting of an excess profits law, the administration and leaders in Congress are giving considerable study to the laws of 1916 and 1918. The former carried excess profits taxes ranging from 8 per cent on salaries exceeding \$6,000 and small business incomes in excess of \$6,000 to 60 per cent on net income that exceeded 33 per cent of invested capital. Corporations were taxed from 25 to 65 per cent on income, after a credit allowance of \$3,000 plus a normal profit for specified prewar years.

Under the 1918 war profits act corporations were allowed a minimum credit of \$3,000 profit plus an 8 per cent return on invested capital. After this allowance, tax rates on profits were 30 per cent on net income up to a 20 per cent return on invested capital and a tax of 65 per cent on a return over that amount.

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EMULSIFYING
CUTTING OIL

Speed... flexibility... smooth action... precision production at full rated capacity — when you flood the work and the wheel with SUNOCO Emulsifying Cutting Oil.

SUNOCO has aided in stepping up production and improving finishes on an almost unlimited variety of ground parts.

If you're interested in close tolerances... mirror-like finishes... with more pieces per wheel dressing — let a SUN Technical Representative get interested in your lubricating problems. Write

SUN OIL COMPANY, Philadelphia, Pa.

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PETROLEUM PRODUCTS FOR ALL INDUSTRIES

The development of an amortization formula was announced on the same day that M. M. Gilman, president, of the Packard Motor Car Co., and Mr. Knudsen conferred on the Rolls-Royce engine program, involving contracts estimated at \$150,000,000. The Packard company had refused to take the contract, fearing that it would not be given adequate amortization protection.

It is thought that the Ford company, which previously had rejected the plan to build 3000 planes for the United States and 6000 planes for Britain might now be willing to take airplane engine contracts, though Henry Ford had based his declination of the contract on the ground that he would not build engines for a foreign government. Assuming he adheres to this policy Ford contracts would cover American defense needs only. Mr. Gilman said that Packard would have to spend \$30,000,000 on new plant and equipment to construct the 9000 planes and that the depreciation would figure heavily in the profit and loss calculations of the company.

The formula has paved the way



M. M. GILMAN, above, is president of the Packard Motor Car Co.

for Federal Loan Administrator Jones to lend funds to private corporations which will have to erect new or expand present facilities for national defense production.

Washington

William S. Knudsen of the National Defense Advisory Commission announced last Friday that the board of directors of the Packard Motor Co. has approved a general arrangement for the production of 3000 Rolls-Royce aviation motors for the United States government and 6000 for the British government.

M. M. Gilman, president of the company, previously informed the commission that the plant will be tooled and prepared to begin actual production 10 months from the date of the contract, and that estimated production will start at the rate of 20 engines per month, reaching a total of 840 per month at the end of 15 months.

THE BULL OF THE WOODS

BY J. R. WILLIAMS



Washington

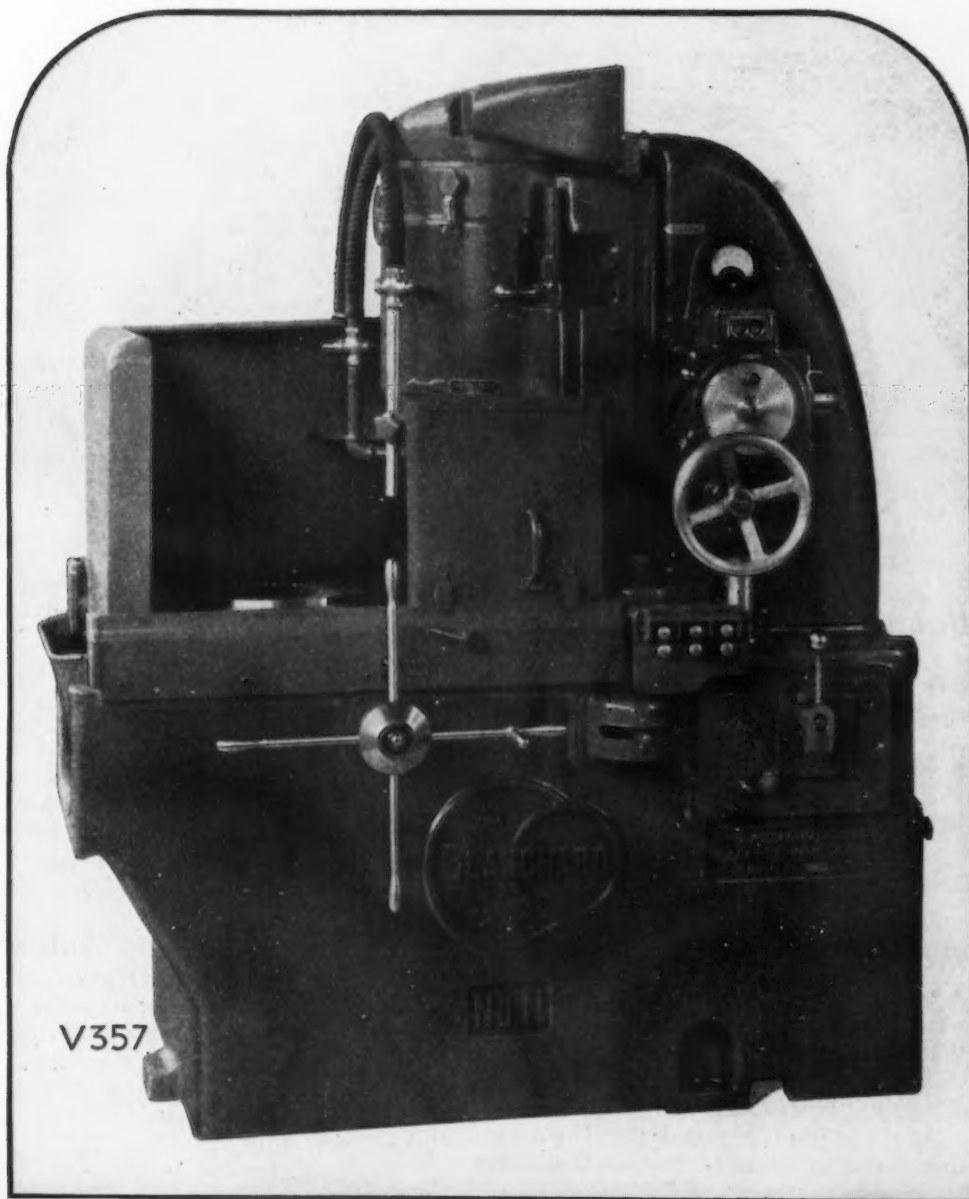
• • • Dewey Anderson, Palo Alto, Cal., has been appointed executive secretary of the Temporary National Economic Committee, which he served as economic consultant the past six months. He succeeds James R. Brackett, who recently was appointed executive assistant to the trustees of the Associated Gas & Electric Co., New York. Mr. Anderson conducted hearings on technology before the TNEC, which were held April 8-26, and is co-director with Prof. P. E. Davidson of the Institute of Occupational Research, located at Stanford University. He has also been engaged in conducting a number of studies and is preparing several special reports for the committee. This alphabetical soup agency will fold up in January unless in the improbable event it is given additional appropriations. It is slated to have one more fling of hearings, set for some time after election. The Federal Trade Commission is preparing to launch a tirade before the committee on steel and other industry ownership of rail lines.

No. 11 BLANCHARD GRINDER

This new small Blanchard has the power, the rigidity, and the ease of control that have made the No. 18 Blanchard so successful. Smaller in overall size than the No. 10 Blanchard which it supersedes, it not only has 50% more power on its spindle but has larger work capacity, 20 inches diameter by 8 inches high under new wheel. Fast, accurate, easy to operate, it has proved profitable for both tool work or small lot production.



Study the details in the No. 11 Catalog. Write for your copy today!



THE BLANCHARD MACHINE COMPANY
64 STATE STREET, CAMBRIDGE, MASSACHUSETTS, U. S. A.

Fatigue Cracks

—BY A.H.DIX—

Two Minds With But . . .

••• We like this in *Reader's Digest*, by William Wrigley: *When two men in a business always agree one of them is unnecessary.*

Birth Note

••• We try hard to use every contribution, but some are difficult to work in. For instance, one of this page's loyal 18 readers thinks it would be interesting if we published a gestation table, and tells us that the interval between conception and birth in chickens is 21 days; ducks, turkeys and rabbits 28 days, pigs and dogs 63 days, cows and humans 9 months, colts 11 months, and elephants 3 years.

All we can think of to hook up with that bit of curiosa is that the life of the average IRON AGE subscription is one year longer than the gestation period of an elephant, being four years. Our subscription renewal rate is about 80 per cent, which is an aitch of a high figure.

Orthological Boner

••• Continuing the discussion regarding the propriety of profanity on this page, we agree that it defeats its own purpose if carelessly employed. For instance, Joseph Lee, Boston school committeeman, has proposed that students and teachers be permitted to split infinitives "*any damn way they wish.*" This sets young minds a bad example, for *damn* is a verb; the adjective is *damned*.

Bouquet

••• The automotive big shot who took time out to write this pen and ink note to Bill Sherman, our Detroit editor, regarding the story on page 74 of the July 4 issue, might not mind if we gave his name, but to be on the safe side we will withhold it:

"You have written the FIRST, and, so far, the ONLY true and sensible summing up of the automotive industry's relation to the 'defense program.'

"It was refreshing to read after the buncombe of the last few weeks."

Acts on Ten-Year Impulse

••• Some time we will hire Dr. Gallup to find out what the true gestation period of a subscription is, that is the interval between the planting of the seed in the prospective reader's mind and the time he actually joins the one big, more or less happy family.

At the moment it seems that the subscription gestation period is equal to that of the common house fly, for new subscribers are coming in at a record-breaking rate. But there are exceptions. We began planting the idea in the mind of a big manufacturer in southern Ohio 12 years ago, and kept at it at semi-monthly intervals. Nothing happened and along about the

tenth year we began to get disheartened. But last week he came in, and instead of being happy about it we find ourselves somewhat let down. He was our most distinguished holdout—a constant rock to which we clung in an ever-changing world. Now we will have to find another rock.

He Wears a 16

••• For smart and timely press agency give us Cluett Peabody, the shirters. In a recent issue John H. Van Deventer, your favorite family journal's editor, derided the placing of obstacles in the prospective customer's path and cited as an example the pins in a new shirt.

The ink had hardly dried on the copy when W. C. Mullally, Cluett Peabody sales director, wrote:

"We are intrigued by the article about pins in shirts. The shirt industry is conscious of this nuisance and to show you what we have done to eliminate as many as possible, we are sending you with our compliments an Arrow shirt size 15, 34 sleeve, which we learned from your local office is your correct size."

Maybe J.H.V.D. can work in a reference to a 40-ft. cruiser in one of his editorials. If he does, we will send marked copies to the yacht people and see how enterprising they are.

Politics

••• A Mr. Schmitt just telephoned that in his interviews with the press Wendell Willkie provides chairs for the reporters. In the White House they have to stand up. The Willkie chairs have no writing arms, but they'll come later.

Which reminds us that the day before the G.O.P. convention ended, at the moment when the delegates were not so sure as the country was that they would decide on Willkie, the financial editor of one of the two major press services and an avid reader of your f.f.j.'s editorials telephoned Jim Rowan, our news editor:

"I have an idea I'm willing to stump for. I'm for Willkie for president and that fellow Van Deventer for vice-president. It would be good for the country to have two good sound guys in charge at Washington."

Jab to the Nose

••• "Hey! Turn to page 69 of the July 4 issue and looking at the 'workman testing threads in the nose of a shell' with a hammer! When this chap gets through, I suggest he test airplanes by flying them into a cliff."—A.W.M.

Sh! The man knows what he's doing. And besides it might have read, "*Workman testing detonator caps with a hammer.*"

Lightning Ratiocination

••• "I was convinced he was a parachutist when I saw him floating to the ground," she said.—*London dispatch to the New York Times.*

Without a parachute, they come down much faster.

Puzzles

••• According to our puzzle book, last week's butcher, who wanted to weigh up to 365 lb. with the smallest number of weights, used these weights: 1, 3, 9, 27, 81 and 243 lb.

If you can do this with a knife, fork and two spoons before the ice in your coffee melts counts yourself a superior intellect:

A man and wife, each weighing 160 lb., have two sons, each weighing 80 lb. They desire to cross a river in a boat that can carry no more than 160 lb. How do they get across?

You Pay the Same for Power - - Delivered or Dissipated!



Mr. Young and Mr. Falk Discuss Roadbeds for Power

Why Falk Engineers Installed DODGE-TIMKEN Pillow Blocks on Annealing Furnace and Foundry Trucks

Dodge-Timken Clamp Sleeve Bearings are used on these Motor Driven Winches in Falk's Welding Shop and Foundry in Milwaukee to pull loaded trucks into gigantic annealing ovens . . . They deliver the power that rolls tons of gears into these huge furnaces for annealing . . . A 20,000-pound pull on the cable is handled by Dodge . . . Annealing Truck, when loaded, carries a total weight of 200,000 pounds on six Dodge-Timken Clamp Sleeve Pillow Blocks . . . Harold Falk, Jr. discusses "Bearings" with Frank Young, Dodge Engineer.

Mr. Falk: Why do you suggest that we put Dodge-Timken Clamp Sleeve Bearings on this Main Shaft as well as the Foundry Trucks?

Mr. Young: Because they offer full radial and thrust load capacity — and they are fully self-aligning.

Mr. Falk: All right — but why Clamp Sleeve?

Mr. Young: Clamp Sleeve Bearings can be quickly clamped in position on commercial cold rolled shafting instead of special turned shafting to take press fit. They can handle those shock loads — because of the full-length sleeve the load is distributed over the entire length of the bearing—reducing pressure per square inch.

Mr. Falk: How will they stand up?

Mr. Young: Remarkably well — because they are equipped with special inde-

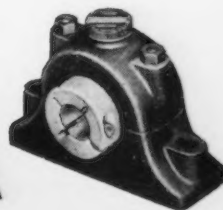
structible steel seals which keep out all dirt.

Mr. Falk: Well, how about costs?

Mr. Young: Low friction, infrequent lubrication and little or no maintenance . . . all combine to give dependable and trouble-free operation.

Mr. Falk: O.K. — Dodge they'll be. Dodge they are and have been for many years . . . Dodge power transmission units have enviable performance records in every branch of industry. For built-in production machine application . . . or for power transmission . . . depend on Dodge.

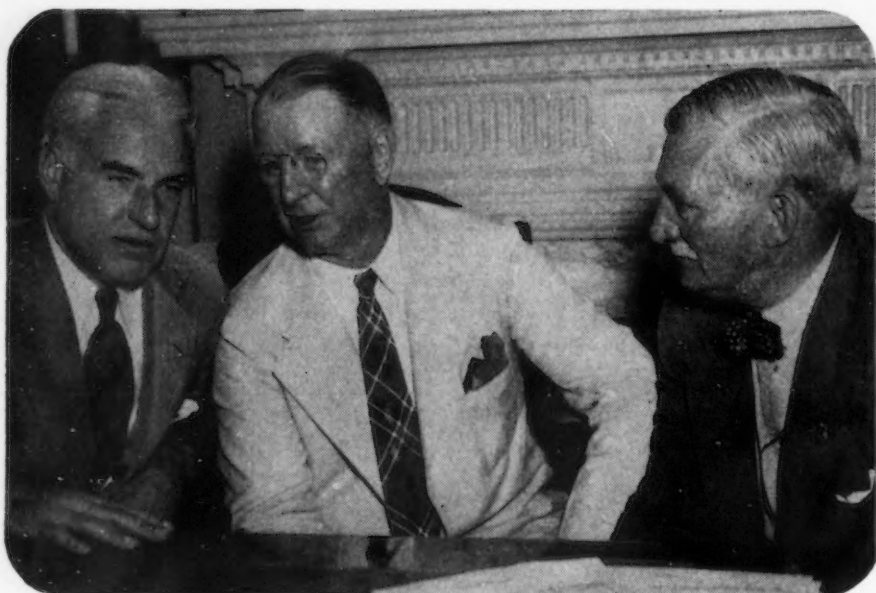
DODGE MANUFACTURING CORPORATION
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THE RIGHT DRIVE - -

FOR EVERY JOB

News of Industry...



EDWARD R. STETTINIUS, left, and William Knudsen, right, of the National Defense Commission, confer with Colonel Frank Knox, the new Secretary of the Navy

Washington Slow in Ordering for Defense, Midwest Industry Finds

Cleveland

... Although cognizant that high praise is due a few government departments and individuals, others at Washington are taking too long to make up their minds regarding armament matters, in the opinion of certain well-informed Middle West industrialists.

While certain official quarters appear to be waiting for an answer to "Who are we going to fight and where?"—key industries are marking time without any clear definition of how big a load they will have to carry. Orders are necessary before American industry can work the necessary miracles. If large numbers of tanks, planes and guns are going to be required in six months' time, obviously the load on certain industries will be tremendous, but if a year or 18 months are allowed requirements can be filled at a more even pace.

Navy buying has been going along faster than usual. Routine buying by the Army has been proceeding a little faster, also, but there is much buying ahead.

At least eight months elapsed before last week's action on the question of a shorter period for amortizing investments in plants and equipment. The President approved a five-year plan for defense industries last week, but it is understood suggestions for such a course of action were first advanced last October by aircraft manufacturers and a little later by other industries. Hesitation and confusion resulted from the indecision in the intervening months.

A more definite rule is said to be needed on permissible elements of cost in computing the 8 per cent maximum profit permitted. As it stands now, industrialists claim the ruling applies more to gross profits than to net profits. Taxes

and sales expenses are among the items to be clarified. Considerable depends on how much turnover an industry has in a year's time. It is expected that rulings will be made before long.

Some key manufacturers, such as airplane parts producers, are still purchasing equipment for British orders and haven't begun figuring on the United States program yet. They don't know where to begin figuring, anyway.

Criticism of specifications has been heard. Rejections for superficial blemishes have become a serious problem in some plants. Excessive machining is another matter freely discussed in this area. Certain forgings weighing around 50,000 lb. are machined down to a mere fraction of their original weight. Scrap losses are very large. A part weighing around 75 lb. frequently is taken down to 10 lb. Some parts must be brought down to absolute perfection without either plus or minus variation.

Some officials are said to be unusually cooperative in accepting technical suggestions, more so than in World War I. A problem recently arose over the band seat on a certain size shell and was quickly adjusted.

Excessive inspection is difficult to cope with at some plants trying for large-scale production. For instance, Magnafluxing aircraft bolts is difficult to accomplish, and virtually impossible on any great quantity of bolts. Yet this question proved bothersome for months before partial adjustment.

Monarch Machine Tool 6-Month Profit \$662,194

... Monarch Machine Tool Co., Sidney, Ohio, for the six months ended June 30, 1940, reports net profit of \$662,194, after depreciation and provision for estimated federal income taxes, equal to \$4.41 a share on the 150,079 shares of common stock now outstanding. This compares with a net profit of \$173,784 for the first half of 1939.

TO KEEP POSTED ON INDUSTRIAL PRODUCTS GET THIS

INFORMATION Free

(1) Perforated Metals:

Architectural grilles and air-conditioning registers and grilles, available in wide variety of designs and metals, are covered in catalog 32. Information of value to architect and engineer in selecting and installing grilles and other forms of perforated metals is given. *Diamond Mfg. Co.*

(2) Automatic Valve Controls:

Illustrations and facts and figures covering use and design of Limitorque automatic valve controls for operating valves from 3 to 96 in. in diameter are given. Remote control applications also described. *Philadelphia Gear Works.*

(3) Machinery Bases:

The use of Unisorb, a felt material, as a base for mounting industrial machinery to reduce vibration and noise is described. Factors as cost, machine efficiency, maintenance expense, etc., are covered. Typical use in automotive, stamping, textile, riveting, compressing equipment, conveyors, etc., are illustrated. *Felters Co., Inc.*

(4) Shell Threading, Tapping:

Use of Landmatic heads and collapsible taps for tapping shells and threading shell bases, lifting plugs, fuse plugs, etc., are discussed and required equipment illustrated. *Landis Machine Co.*

(5) Metallizing:

Booklet describes Metallizing process and giving information on new models P and S Metallizing guns. Another booklet covers various Metallizing applications. Equipment prices are given and history of aluminizing process to combat oxidation resulting from high temperatures is recounted. *Metallizing Co. of America.*

(6) Welded Piping Outlet:

Welded outlets for piping in stock sizes from 1/4 to 12 in. are illustrated and advantages noted in bulletin WT29. Newly developed socket-end WeldOlets, which eliminate all cutting, threading and fitting of the main pipe and eliminate beveling or threading of the branch line are also described. Typical installations are shown. *Bonney Forge & Tool Works.*

(7) Expansion Joints:

Gun-Pakt expansion joints, the use of which eliminates shutdowns for repacking, are described in bulletin J-E1907. Joints can be repacked under full steam pressure, are equipped with Alemite fittings on packing and sliding sleeves and are also manufactured with ends prepared for welding. Also available is bulletin T-1735 covering improved features of impulse steel traps. *Yarnall-Waring Co.*

(8) Steel Stamps:

Mechanical devices for marking pipe, flanges, tubing and bars and various models for marking flat surfaces are described. Hand holders for light marking, for bar and cylindrical shape marking and heavy handle-type steel mill markers are also covered. Design permits rapid changing of marking type. *Jas. H. Matthews & Co.*

(9) Shovels and Draglines:

Rugged, mobile type 1201 shovels and draglines are covered. Low center of gravity, one-piece machinery base, extra large shipper shafts, helical cut gears and

mounting of levers on square lever shafts to eliminate keys are among features noted. *Lima Locomotive Works, Inc.*

(10) Molding Machines:

Recent improvements in power jolt roll-over draw, arm-type jolt squeeze strippers and jolt pin lifters are described in bulletins 108, 106 and 109 respectively. Construction details and operating characteristics are discussed. *Milwaukee Foundry Equipment Co.*

(11) Enduro:

Properties and fabricating instructions covering heat-resisting, high-strength types of Enduro are given in booklet ADV-364. Types HCN, NC-3 and HC are described. *Republic Steel Corp.*

(12) Carload Shipping:

"Cardoor Bracing Solid Carloads with Signode Anchor Strapping" shows how shippers of packaged products in solid carloads can carry out the packaged idea even in carloading operations. Also shows how damage can be avoided by preventing shifting, etc. Hacking, sawing and nailing not required. *Signode Steel Strapping Co.*

(13) Warehouse Steel:

New 1940 stock list just published is said to be largest and most complete steel buyer's guide ever issued by company. Contains listings of new products, new analyses, new sizes and numerous charts and tables to assist buyers of warehouse products. SAE specifications, machinability of 50 steels, gage comparisons, etc., are also included. *Joseph T. Ryerson & Son, Inc.*

(14) Small Air-Cooled Engines:

Light, modern, air-cooled gasoline engines for stationary or portable use illustrated and construction features explained. These two-cycle motors have only three moving parts. One hp. motor weighs 38 lbs.; two hp. weighs 78 lbs. Especially recommended for power lawn mowers, lighting plants, compressors, small vehicles and other light industrial commercial use. *Jacobsen Mfg. Co.*

(15) Foundry Equipment:

General catalog No. 60 contains a complete summary, amply illustrated, of company's foundry equipment, such as Wheelabrators, Tumblasts, Tablasts and special cabinets, Dustube dust collectors, sandcutters, core machines, flasks and jackets, rod straightener and shear machines and sandblast equipment. Unique customer's demonstration room and laboratory also shown. *American Foundry Equipment Co.*

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(16) Rotary Pumps:

Construction features and performance characteristics of new line of rotary pumps are covered in catalog 939. New built-in safety pressure release valve, mirror finish roller bearings, cushioned vibration absorption and eight different piping arrangements are described. Section giving data essential to selecting proper pump for job to be performed included. Materials that can be handled are listed. *Geo. D. Roper Corp.*

(17) Die Casting Design:

Compilation of practical information and suggestions relating to design of die castings. Shows methods of reducing assembly costs, ways to cut parts cost and gives an idea of versatility of process. Methods of finishing are also covered. *New Jersey Zinc Co.*

(18) Safety Shoes:

New 1940 buyers guide and catalog of safety shoes describes construction of shoes in non-technical language, tells how proper types can be chosen for greatest economy and lists 60 styles. *Lehigh Safety Shoe Co.*

(19) Foundry Conveyors:

Catalog, profusely illustrated with action photographs, contains numerous suggestions for improving production methods in foundries by proper use of conveying equipment. Several typical foundry handling systems are shown. *Chain Belt Co.*

(20) Wire Rope Slings:

Third edition of 96-page "Riggers Handbook" contains descriptions of company's wire slings and equipment and gives valuable hints for lengthening life and increasing safety of such equipment. Well illustrated. *Broderick & Bascom Rope Co.*

(21) Thermocouples:

Bulletin S2-2 illustrates and describes thermocouples, thermocouple wire, lead wire, insulators, protecting tubes and other accessories which may be used with all standard types of pyrometers and temperature controllers. Detailed price list included. *Wheelco Instruments Co.*

(22) Flexible Shafts:

New 40-page illustrated catalog covers company's complete line of flexible shaft equipment. *R. G. Haskins Co.*

(23) Shell Holding Equipment:

Timely 20-page bulletin, complete with explanatory line drawings, covers air and hydraulic shell holding machines and

auxiliary operating equipment. Said to be the first time such drawings and data have been assembled and available for general use. *Logansport Machines, Inc.*

(24) Industrial Floors:

Colordex, a floor dye available in four colors and having excellent wearing qualities is described. Material is not a paint, but a resin base dye. Is applied with a brush, gives a clean gloss surface, preserves wood floor and protects concrete. *Fleerack Co.*

(25) Steam Cleaners:

High pressure Jenny steam cleaners for general industrial use illustrated. Use cleaning machinery, aircraft, buildings, floors, etc., illustrated. Machine is portable and is said to cost an average of 20c. per hr. to operate. *Homestead Valve Mfg. Co.*

(26) New Respirator:

New dust respirator, weighing only 1 1/4 oz. and capable of excluding particles as small as one micron, is announced. Efficiency is said to be very high. Has been approved for protecting against inhalation of pneumoconiosis producing dusts and nuisance dusts as aluminum, cellulose, cement, coal, coke, iron ore, limestone, etc. *American Optical Co.*

(27) Furnace Controls:

Complete line of modern thermometer and pyrometer controllers for gas, electric and oil fired industrial furnaces, kilns and ovens described in bulletin 548. Automatic control valves and various air and electrically operated controllers also covered. *Bristol Co.*

(28) Cooling Fans:

Trufo man cooling fans, constructed for hard usage and designed so that the flow of air does not necessarily play directly on workers, are described. Fans are available in five standard designs and wide range of sizes. Adapted for movement by crane. Stands, guards and specification details covered. *Trufo Fan Co.*

(29) Rust Proofing:

ACP Rust-Proof, a liquid chemical, which can be applied by spray gun or brush and which minimizes re-painting due to rusting, is described in leaflet No. 7-8. One gallon of material, which is said to stop rusting under paint and to prolong life of paint, will cover 200 to 500 sq. ft. of metal. Preparation of metal and application of Rust-Proof discussed. *American Chemical Paint Co.*

(30) Stop Nuts:

Concise explanation of construction and self-locking action of Elastic stop nuts and a graphic listing of the advantages to be obtained from their use given in folder L40-10. Typical uses are illustrated. *Elastic Stop Nut Corp.*

(31) Gear Measuring:

New simplified system for measuring spur gears with precision wires, which makes possible more accurate measurements and reduces calculations to one of simple division, described in circular G33. Tables of measurements over wires for external and internal spur gears of 14 1/2 deg., 20 deg. and 30 deg. pressure angles are included. *Van Keuren Co.*

(32) Crawler Cranes:

General discussion of noteworthy construction and operating features of various types of crawler cranes, stressing their unusual flexibility and versatility. Use of cranes in large numbers of industries is illustrated. Equipment employed in making the alloy steels used in the cranes are described. Bulletin LCC-1. *Buoyrus-Brie Co.*

Blast Furnace in Texas Proposed

••• Harry Wright, president of La Consolidada, S. A., Mexico City, Mex. (Consolidated Steel Co. of Mexico) has supplied THE IRON AGE with details regarding the project of his company to build a blast furnace at Eagle Pass, Tex.

Within the past five years, says Mr. Wright, his company has acquired a group of iron mines in the northeastern part of the State of Chihuahua, Mexico, about 80 miles from Presidio, Tex., on the Santa Fe Railroad. This ore analyzes 60 to 68 per cent iron, 1.7 per cent silicon, 0.2 to 0.3 per cent manganese, 0.09 per cent phosphorus. There are millions of tons on the surface.

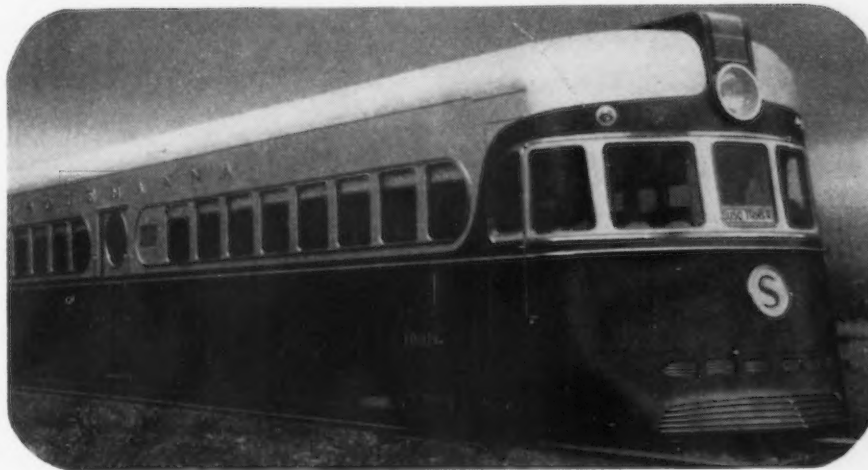
About 75 miles from the Mexican border on the National Railways are large deposits of coking coal. At these mines the American Smelting & Refining Co. of New York is making about 30,000 tons of coke a month, part being used by the Monterrey Iron & Steel Works at Monterrey, Mex.

Mr. Wright explains that the proposal to build a blast furnace in Texas instead of in Mexico is due to the fact that Mexico could not absorb the output of a 500-ton furnace, which it is tentatively planned should be built, and that part of the output could be disposed of in Texas and part in Mexico.

"At the present time," says Mr. Wright, "there is a larger demand for steel in Mexico than the present production, but there is not sufficient demand to take the production of a 500-ton furnace."

Whether the project will eventually go further than the production of pig iron and coke has not been decided, says Mr. Wright.

For the past five years La Consolidada has operated open-hearth furnaces at Piedras Negras, Mex., which is across the river from Eagle Pass, Tex. A part of the output of the proposed blast furnace would be consumed in that steel plant and some would probably be sold to the Monterrey Iron & Steel Works. The ingots produced at Piedras Negras are shipped to Mexico City for rolling into bars.



THIS IS A NEW TYPE suburban passenger car built by American Car & Foundry Co. for the New York, Susquehanna & Western Railroad.

New Type Railroad Car Demonstrated

••• A development in railroad passenger service which may open up new uses for steel and aluminum is a rail motor car designed and built by the American Car & Foundry Co. for the New York, Susquehanna & Western Railroad and demonstrated to railroad officials and others last week. The new car is especially adapted for suburban service or on branch lines and is suggested as a method of enabling railroads to compete with bus lines on short routes.

The car is of streamlined construction, constructed of low alloy, high tensile steel assembled by welding and riveting, with roof sheets of aluminum and inside finish of aluminum and steel. The

power equipment consists of one 290-hp. Waukesha-Hesselman type super-charged oil engine, pancake type. The engine is placed under the floor of the car so as to provide maximum seating capacity. Each car seats 80 persons. Improved riding comfort is provided by special springs, air conditioning and sound deadening. The service weight is 78,040 lb. The weight of the steel and aluminum is about 30 tons, mostly steel.

The American Car & Foundry Co. believes that there will eventually be a large demand from the railroads for cars of this and similar type, which are said to offer the lowest cost per passenger mile of any form of transportation.

Bids Sought for Aug. 3 On More C-3 Cargo Ships

Washington

••• The Maritime Commission has invited bids for Aug. 6 on the construction of another group of C-3 type cargo ships. While the invitations said that bids may be entered on one to six vessels with either diesel or steam propulsion, officials explained that the number of ships to be ordered "will depend on the prices quoted."

Requiring about 4370 tons of steel each, the C-3 type cargo ships which have previously been ordered by the commission total 18. The vessel is 492 ft. overall, of 11,750 deadweight tonnage, has a designed speed of 16½ knots, but will do better than 19 knots.

Coming Meetings

July 22 and 23—Institute of Scrap Iron and Steel, mid-year meeting, Buffalo.

Sept. 3 to 6—American Society of Mechanical Engineers, fall meeting, Spokane, Wash.

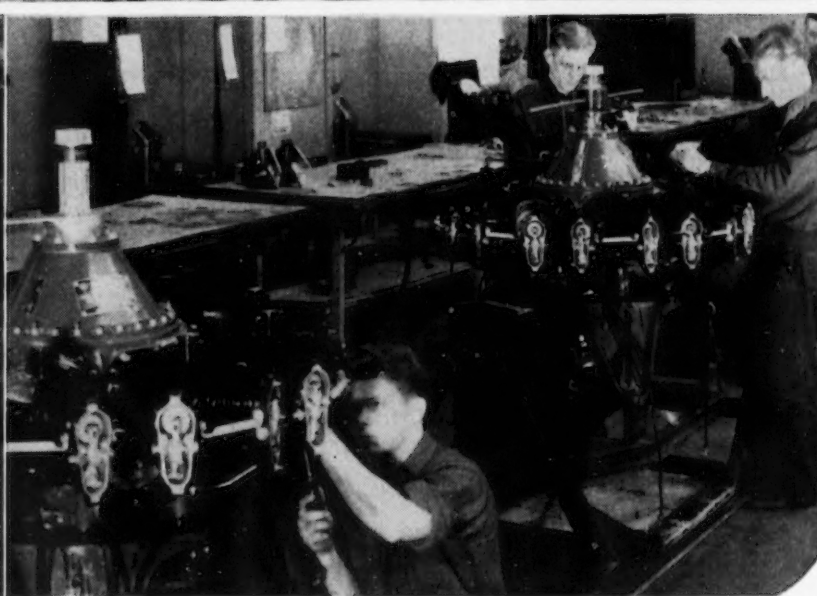
Sept. 24 to 27—Association of Iron and Steel Engineers meeting and exhibition, Chicago.

Oct. 21 to 25—National Metal Congress, Cleveland.

Oct. 31 to Nov. 2—Society of Automotive Engineers, national aircraft production meeting and exhibition, Los Angeles.



WRIGHT AERONAUTICAL
Corp.'s new No. 2 plant at Paterson, N. J., from the air, is pictured below. At the left, the simultaneous grinding of outside diameter of top and bottom lands on engine cylinder barrels. In the foreground, bottom left, rough steel forgings that are machined into cylinder barrels. Bottom right, a close-up of one of the Wright assembly lines.



War Gives 20,000 Jobs in Cleveland

Cleveland

••• Sharp increases, resulting both directly and indirectly from the war, are shown in business statistics covering the first six months of this year here. Employment and payroll figures, expansion programs and establishment of new businesses are all up.

J. W. Van Den Bosch, statistician for the Chamber of Commerce, reported an average of 140,500 workers employed in manufacturing establishments in Cuyahoga County the first six months of this year, compared with 120,200 average the first six months, of 1939, a gain of 16.6 per cent.

Industrial payrolls in the county, he said, aggregated \$108,000,000 the first six months of this year, against \$90,000,000 the first half of 1939, a gain of \$18,000,000.

The outlook for July industrial activity is encouraging, as 23 of the 100 plants reporting to the chamber monthly expect to expand operations this month, while only four predict some curtailment. Thirty-nine will operate at current levels.

The importance of war materials production to Cleveland industry is reflected in a study made by the chamber which showed that while plants engaged exclusively in products for public consumption dropped about 2106 workers due to seasonal conditions, this number was absorbed by industries engaged in production of war materials.

Average hours worked per week during June was 39.1, the same as in April and May. The hiring rate for unskilled labor was 54.8 cents per hr. as compared with 54.9 cents at the end of May and 54.1 cents at the end of June last year.

Mr. Van Den Bosch's report showed also:

Employment of 73,942 workers in 100 major industries at the end of June, against 62,124 a year ago, a gain of 11,810 workers.

Establishment of 37 new industries, occupying 230,000 sq. ft. of floor space and further augmenting payrolls \$607,000 annually.

Reedal Heads Army Office in Cleveland

Cleveland

••• Maj. Harold M. Reedall is now in charge of the Army Ordnance office in the Keith Building, which will supervise manufacture of materials for the defense preparedness program. He succeeds Col. P. G. Blackmore, who has been in the local office three years, and will become ordnance officer on the staff of Gen. Percy Bishop, corps area commander at Omaha.

Maj. Reedall came from St. Louis where he had been in charge of ordnance for five years. The Cleveland area extends south to Columbus, east beyond Erie, Pa., and west to Toledo.

Expansion of facilities by 53 industrial firms which have added 670,000 sq. ft. of floor space at a cost of \$5,200,000.

Operations of steel fabricators and machine shops in the Youngstown district averaged 20 to 35 per cent higher during the first six months this year than for the same period in 1939. The outlook for practically all is excellent for continued high rate of operation through the summer months.

National Tube Plants Suspend for Vacations

Cleveland

••• Principal production units at the National Tube Co. plant in nearby Lorain, Ohio, are idle this week. Around 5000 employees with five or more years' continuous service are enjoying their annual vacation period. The plant will resume production next week. Blast furnaces are banked. Dock workers, the maintenance crew and a coke oven crew are remaining at work. Eligible employees of these crews will be given their vacations later this year.

1940 Construction Jobs at New High

••• Engineering construction awards placed in the past week totaled \$98,039,000, the highest weekly volume reported thus far in 1940, according to *Engineering News-Record*. In the preceding short holiday week awards were \$31,599,000.

The week's high volume was due primarily to the awarding of a contract for shipbuilding docks at Philadelphia and Norfolk Navy yards valued at \$16,175,000, and a contract for two hydro-electric projects for Nantahala Power & Light Co., Franklin, N. C., costing \$12,500,000.

Private awards in the week amounted to \$34,012,000 and publicly financed work totaled \$64,027,000.

Private awards for the year to date amount to \$526,149,000, or 26 per cent above a year ago, while awards for public projects thus far in the current year total \$993,105,000, or 20 per cent below a year ago.

American Bridge Builds New \$1,000,000 Barge Shop

Pittsburgh

••• American Bridge Co. has begun construction of a new barge shop at its Ambridge, Pa., yards on the Ohio River. The new building, to cost approximately \$1,000,000, will be 800 ft. long and 125 ft. wide. It will permit barges and boats to be built under more favorable conditions and will be designed to provide for immediate launching from the river bank.

Follansbee Reorganization Is Reported Completed

Pittsburgh

The reorganization committee of Follansbee Brothers Co. reports that the entire assets of the company have now been transferred to the new Follansbee Steel Corp. Operations at the company's Follansbee, W. Va., plant are at 80 per cent of capacity.

Trade Notes . . .

Criterion Tool Sales, 403 North Foothill Road, Beverly Hills, Cal., have completed facilities for the manufacture, sale and service of Vascoloy-Ramet carbide tipped cutting tools. Standard and special tantalum-tungsten carbide tools are manufactured in the plant of Criterion Machine Works, who have stocked a large supply of Vascoloy-Ramet blanks in a variety of grades suitable for machining cast iron, steel and non-ferrous materials. The cemented carbide division is operated under the supervision of A. J. Denis, a former Detroit tool engineer with a background of long experience in the design, sales and service of carbide tools.

Murray-Baker-Frederic, Inc., has been appointed agent for tool steels in the area comprising Louisiana, the larger portion of east Texas, as well as the southern portion of Arkansas, for Allegheny Ludlum Steel Corp. A comprehensive stock of Allegheny Ludlum tool and high speed steels will be carried.

Screw Machine Specialties Co., Grand Haven, Mich., has moved into a new plant approximately 5000 sq. ft. in area on Fulton Avenue in Grand Haven. The organization is motorizing all present equipment and buying some new machinery, according to Abraham Kieft and his associates, Fred and F. A. Kieft.

Burling Instrument Co., 241 Springfield Avenue, Newark, N. J., maker of laboratory and industrial heat controls, has appointed Lester L. Crahan, 1621 South Grand Avenue, Los Angeles, as California distributor and Edward E. Berthet, 2832 East Grand Boulevard, Detroit, as distributor in that area.

Joseph D. Wood, president, Roller-Smith Co., Bethlehem, Pa., announces the transfer of the company's switchboard division to a recently acquired plant in Allentown, Pa. The air and oil circuit breaker and instrument divisions will remain in Bethlehem.

Allis-Chalmers Mfg. Co., Milwaukee, has established a new branch office in the Knight building at Charleston, W. Va., with R. L. Halstead, formerly of Cincinnati, as manager.

William Jessop & Sons, Inc., New York, manufacturer of tool steel, has appointed Bissett Steel Co., Cleveland, as sales representative for northern Ohio, western New York and Pennsylvania. Thorvald L. Haines has been appointed district manager of the Jessop company's Chicago office.

Cowles Detergent Co., 10525 Carnegie Avenue, Cleveland, has appointed James H. Rhodes & Co., Long Island City, N. Y., and 153 Hubbard Street, Chicago, as distributors of Cowles anhydrous metal cleaners.

Cutler-Hammer, Inc., Milwaukee, has moved its Minneapolis office and warehouse to larger quarters at 532 South Seventh Street. Horace H. Ratcliff, Clyde A. Russ and Donald Ludwig represent Cutler-Hammer in the Minneapolis territory.

New Wrinkle, Inc., Dayton, Ohio, licensors of processes and finishes, announce that a manufacturing and distributing license for Wrinkle finishes has been granted J. Dampney Co., Ltd., Newcastle-on-Tyne, England.

Harbison-Walker Refractories Co. has purchased the Athens plant of the Athens Brick & Tile Co., Athens, Texas. The purchase covers all plant equipment, inventories, accounts receivable, etc., and the plant is now being operated as a unit of Harbison-Walker Refractories.

F. L. Robertson, 56-58 Rano Street, Buffalo, has taken over the manufacture and distribution of the single pull countershafts, and belt shifters formerly made by the Builders Iron Foundry, Providence, R. I.

King Fifth Wheel Co. has purchased a site at 2915-2933 North Second Street, Philadelphia, 100x119 ft., including three connected one-floor buildings. One or two bending rolls will be purchased.

Allegheny Ludlum Steel Corp., Pittsburgh, has appointed Peden Iron & Steel Co., Houston, Tex., as agent in that area for tool and high speed steels.

Kearney & Trecker Corp., Milwaukee, Wis., recently completed a motion picture in color of its model D rotary head tool and die milling machine.

Reading-Pratt & Cady Division, American Chain & Cable Co., Inc., has moved its general sales office from Bridgeport, Conn., to Reading, Pa.

Cosa Overseas Trading Corp., 5000-4 Chrysler Building, New York, has been organized with E. T. Laubscher as president.

All-Steel Equip Co. reports work well under way on a 40,000 sq. ft. addition to its main plant No. 1 at Aurora, Ill. The company manufactures the A-S-E Aurora filing equipment and steel lockers.

Davis & Thompson Co., 6619 West Mitchell Street, Milwaukee, maker of automatic production machinery, has been sold to Louis E. Emmerman & Co., Chicago.

Allegheny Ludlum Steel Corp., Pittsburgh, has appointed Murray-Baker-Frederic, Inc., New Orleans, as its agents for tool steels in Louisiana, east Texas and southern Arkansas.

George Scherr Co., Inc., 128 Lafayette Street, New York, has been appointed national distributor for the line of Reed micrometers, manufactured by the Reed Small Tool Works, Worcester, Mass.

Ashcroft Gauge Division, Manning, Maxwell & Moore, Inc., Bridgeport, Conn., announces its indicating pressure gages and recording gages, formerly merchandised under the trade name "Ashcroft American," are now known simply as "Ashcroft."

Elastic Stop Nut Corp. has moved its general offices from Elizabeth, N. J., to its new plant at 2332 Vauxhall Road, Union, N. J. The company's Houston, Texas, office has been moved to the Merchants and Manufacturers Building.

Hartford Mfg. Co., Hartford, Wis., has been organized to manufacture and sell parts for automobiles and tractors. Organizers are J. P. Marx, M. C. Marx and H. F. Feeney.

Emsco Refractories Co. announces opening of a new office at 8601 Dorothy Avenue, Los Angeles, Cal.

C. Howard Eden, 1031 South Broadway, Los Angeles, has been appointed sales representative by Michigan Tool Co. to handle sales of gear-finishing, lapping and "Sine-Line" checking equipment for the Los Angeles area. D. E. Schellenbach, 3245 16th Street, San Francisco, has been appointed representative for the northern half of California and four western counties in Nevada. The Henry Walke Co., Norfolk, Va., has been appointed sales representative in the eastern half of Virginia and Washington, D. C.

Micromatic Hone Corp., manufacturers of honing machine tools, has moved to larger quarters at 1345 East Milwaukee Avenue, Detroit. The expansion represents an increase of 75 per cent in number of employees and more than 100 per cent increase in space occupied during the last 18 months.

US Electric Welder Corp., 1224 West Bancroft Street, Toledo, Ohio, has been incorporated with J. L. Fosnight as president and general manager. Mr. Fosnight for 24 years has been sales manager of Electric Auto-Lite Co.'s USL Welder Division, of which he has now acquired control.

Medart Co., manufacturing engineers, power transmission machinery, St. Louis, Mo., has purchased the wood pulley stock of the Reeve Pulley Co., which has discontinued manufacture and marketing of wood split pulleys.

Republic Machinery Co., Toledo, Ohio, has been formed to take over the machine tool division of National Supply Co. Headquarters are at 416 Richardson Building.

The Universal Gear Corp., Indianapolis, Ind., has appointed James T. Castle and associates as district sales representatives for the Pittsburgh territory with offices at 424 First Avenue, Pittsburgh.

Cowles Detergent Co., Cleveland, has appointed James H. Rhodes & Co., Long Island City, N. Y., and 153 Hubbard Street, Chicago, as distributors of Cowles anhydrous metal cleaners.

The T. L. Arzt Foundry Co. has moved its office to 4020-30 West Schubert Street, Chicago.

Dennis Steel Co., buyer of all kinds of metal scrap, has opened an office and warehouse at 708 Fulton Street N. W., Grand Rapids, Mich.

Kulka Iron & Metal Co., Alliance, Ohio, has purchased the Lakeside, Marblehead & Toledo Railroad.

Brumberger Co., Inc., has moved its office and factory to Bush Terminal Building No. 6, 34 34th Street, Brooklyn, N. Y.

Cutler-Hammer, Inc., has moved its Pittsburgh office to the Park Building at 355 5th Avenue.

Ohio Finds Applications Heavy For Classes Training Mechanics

Cleveland

••• Several hundred skilled mechanics have left Cleveland in the last two months to accept jobs at government arsenals, Navy yards and other plants, according to United States Civil Service officials.

Between 175 and 225 men and women are inquiring each day about Civil Service jobs and examinations. A large percentage of these persons apparently are capable of meeting the stringent qualifications covering experience and education for the wide diversity of jobs.

At the same time, noteworthy speed is being made in establishing facilities for training machine tool operators in Cleveland and other Ohio cities. In this city the two technical high schools are giving summer courses for the first time in years, and the NYA is readying a machine shop for similar courses. Bellevue High School at Bellevue, Ohio, is offering a ten-week course ending Sept. 6, restricted to employables who are American citizens. Classes are held five days per week, approximately five hours per day, in blueprint reading, gage usage and machine operations.

At three Youngstown schools, Chaney, East and Rayen, shop classes began July 8 as part of the program approved by President Roosevelt one week earlier. Youngstown was one of the first cities to begin training technicians, the classes being financed by the government. Rayen School and Chaney High School have one class each for mechanics. East High has two classes, one in electrical and one in auto work. Approximately one hundred unemployed men, most of them under 30, are enrolled.

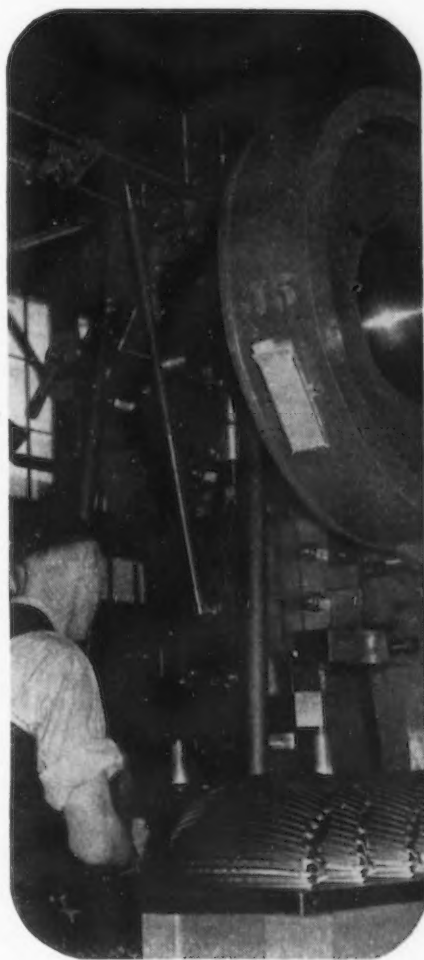
Many men are waiting to enroll, Superintendent Pliny H. Powers, of Youngstown, said, and will be given the opportunity as fast as certified teachers can be obtained and quarters provided.

Classes will start in the mills as soon as foremen can get them arranged, probably this week. Two-hour sessions will be offered there.

School sessions last six hours, beginning at 9 a.m. Mr. Powers believes that a year's preliminary training can be given in an intensified six-week program.

Most of those enrolled at Youngstown are comparatively young men, some out of high school several years and unable to find work. Several are in their 30's and said they had "bummed around from one job to another" because they had no training and employers would not give them a chance.

THIS WORKMAN, according to the Canadian Director of Public Information, is stamping out magazine half sections which later will be welded in a special device that leaves no seam to hamper the flow of cartridges to the breech of a Bren gun



Navy Orders Cable To Demagnetize Mines

Washington

••• Contracts awarded the past week by the Bureau of Supplies and Accounts, Navy Department, included purchases of degaussing cable, which is run around the exterior or interior of naval vessels to de-magnetize enemy mines. Orders placed for this cable and other equipment follow:

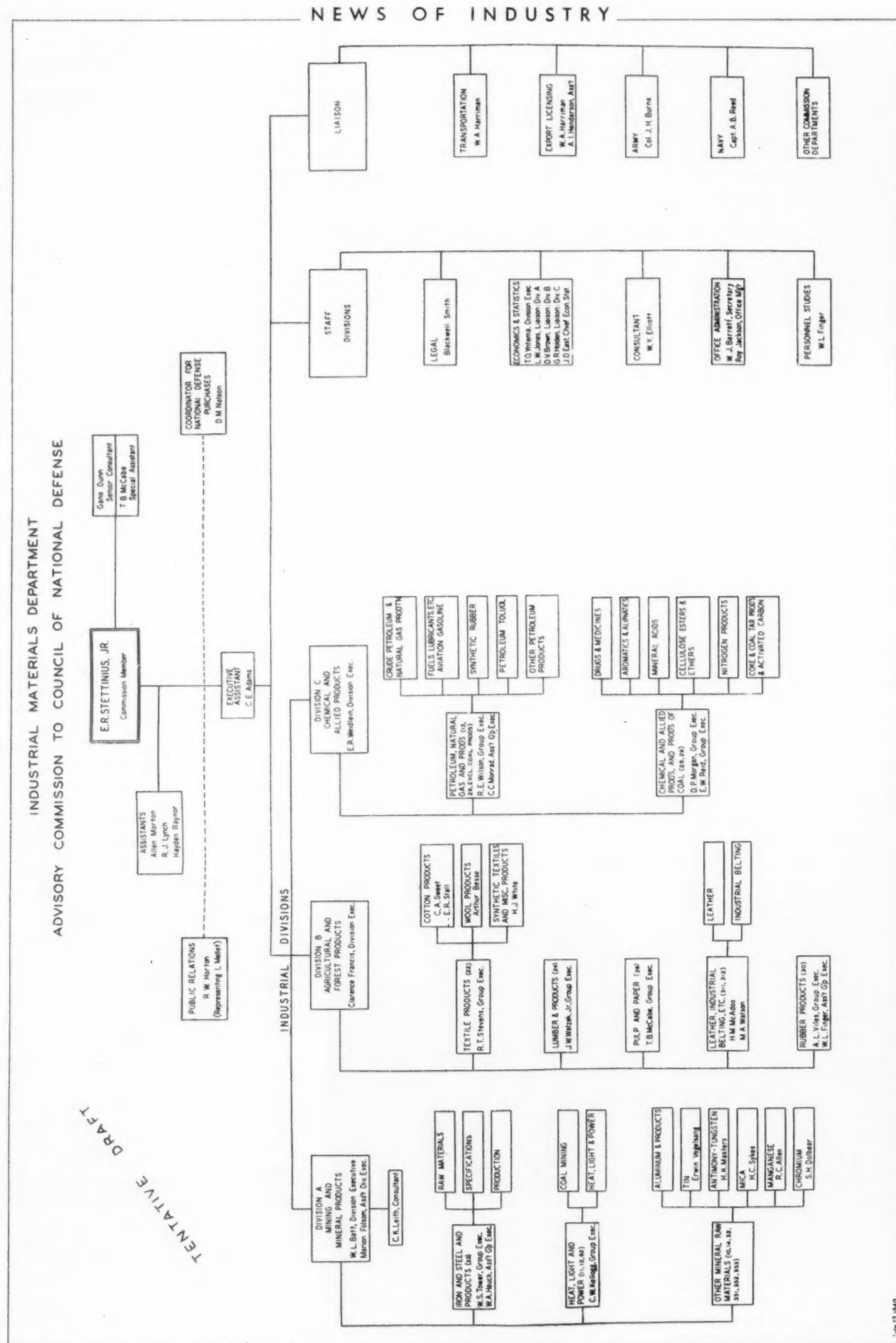
Carlan Tool Co., Elizabeth, N. J., valve reseating outfits, \$7050; General Electric Co., Schenectady, N. Y., motor generator sets, \$7870; Worthington Pump & Machinery Corp., Washington, pumps, \$59,760; Swind Machinery Co., Philadelphia, drilling machines, \$6048; Mine Safety Appliances Co., Pittsburgh, submarine escape apparatus, \$207,722; C-O-Two Fire Equipment Co., Newark, N. J., fire extinguishers, \$118,978; A. Lietz Co., San Francisco, sounding machines, \$11,495; and American Metal Co., Ltd., New York, copper, \$33,150.

Ingersoll-Rand Co., Washington, air compressor, \$8152; Electric Boat Co., Groton, Conn., mufflers, etc., \$64,260; Gardner Denver Co., Washington, compressors, \$22,061; Okonite Co., Passaic, N. J., degaussing wire, \$48,028; Anaconda Wire & Cable Co., New York, degaussing wire, \$48,028; Crescent Insulated Wire & Cable Co., Trenton, N. J., degaussing wire, \$32,732, and the General Machinery Co., Hamilton, Ohio, boring machine, \$162,550.

Allegheny Ludlum Earns \$1,008,121 in 1st Quarter

Pittsburgh

••• Allegheny Ludlum Steel Corp. reports consolidated net profit of \$1,008,121 for the second quarter of this year after depreciation, depletion, normal federal taxes, defense super-taxes and other deductions, equal to 75.7c. a share on common stock. The earnings for the first quarter of 1940, previously reported as \$1,000,297, have been reduced by \$33,699, on account of charges for defense super-taxes, thus making net earnings for the first half of 1940 \$1,974,719.



HERE IS SHOWN the tentative lineup of the industrial materials department, advisory commission to the Council of National Defense. The department, headed by Edward Stettinius, Jr., former chairman of U. S. Steel Corp., is speeding up the supplying of materials for defense industries. (See story on page 72.)

*"Quality Can Always Be
Proven By Test"*

Ferro Silicon

Ferro Manganese

Ferro-Chrome

Silico-Manganese

Silico-Chrome

Simanal



*Ohio Ferro-Alloys Corporation
Canton, Ohio*

Defense Board Gets Full Aid From President, Others, Stettinius Says

Washington

••• Holding his first press conference since taking up his work with the government, Edward R. Stettinius, Jr., in charge of the materials division of the National Advisory Commission, in a free and frank discussion last Saturday painted an optimistic picture of progress being made by the organization in the preparedness program.

Displeased over reports of confusion and conflict, the former chairman of the United States Steel Corp., paid tribute to the cooperation the commission is receiving from the President down through all the affected federal agencies and from industry. Surveys and studies made by the division, Mr. Stettinius said, "offer reliable indications that we may expect to have available as needed

by defense industries adequate supplies of critical and strategic materials."

With charts before him, Mr. Stettinius said that obtaining extraordinary supplies of some materials will naturally require greater effort and perhaps more ingenuity than others. The situation generally, however, was declared to be more hopeful "than we anticipated six weeks ago when this commission was appointed by the President."

Describing the situation regarding individual products, Mr. Stettinius said that production of heavy armor plate will be adequate to meet the enlarged program. He explained that the required capacity will be available under the contemplated expansion program. Representatives of the steel industry, he stated have had

light armor plate requirements for the tank program already placed before them and are preparing to increase production facilities to meet requirements.

Actual acquisition of strategic and critical materials, Mr. Stettinius stated, is proceeding at a most encouraging rate. He told how word came to the commission one Monday morning from the Chinese government that a stock of tungsten and antimony, produced principally outside of this country, was available near Indo-China. The day after receipt of this information, Mr. Stettinius said, these supplies had been purchased through the Reconstruction Finance Corp., and "today they are on the ocean bound for the United States aboard an American flag-ship."

The transaction, it was added, would have been impossible without cooperation of the RFC, the Procurement Division of the Treasury and the Maritime Commission. Regarding rubber, Mr. Stettinius said that it is expected that before the present month is over a plan of synthetic rubber production will have been worked out which in the future could eliminate dependence upon imports. Mr. Stettinius cited other examples of progress, among them the following:

Tin: Largely imported from Straits Settlement. Reconstruction Finance Corp. is cooperating with industry in this country to build up an adequate stock pile and has set up the Metals Reserve Corp. to purchase tin and other defense metals.

Tin smelter: Conferences have been held with four principal smelting companies in the United States working toward erection of tin smelting plant in the United States. This project was undertaken in the face of the possibility that the tin supply from the Straits Settlement might be cut off. Tin ores are now produced in Bolivia and shipped to England for smelting. This step could be eliminated by smelting in this country.

Aluminum: Essential to the airplane program. Industry has advised the commission of plans for expansion and its willingness to erect plant to cover entire program as needs develop.

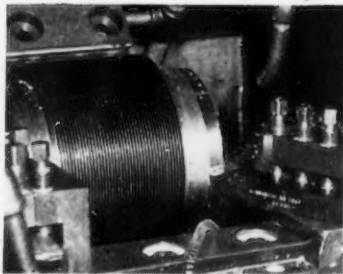
Toluol: Essential part of TNT. We find industry has given con-

SPEED UP NATIONAL DEFENSE with **KENNAMETAL** steel-cutting

Scores of plants producing airplane parts, tanks, guns, shells and other armaments are now speeding up production with KENNAMETAL-tipped tools. Wright Aeronautical Corp., for example, specify KENNAMETAL on most steel cutting jobs in their Paterson, N. J., plant.

KENNAMETAL is also reducing machining time of parts for trucks, tractors, railroad cars, locomotives and other auxiliary equipment so vital to National Defense.

Let us show you how KENNAMETAL can increase your production of hard steel parts from 30 to 50%—*with no additions to your present machine tool investment.* There is no obligation—write today.

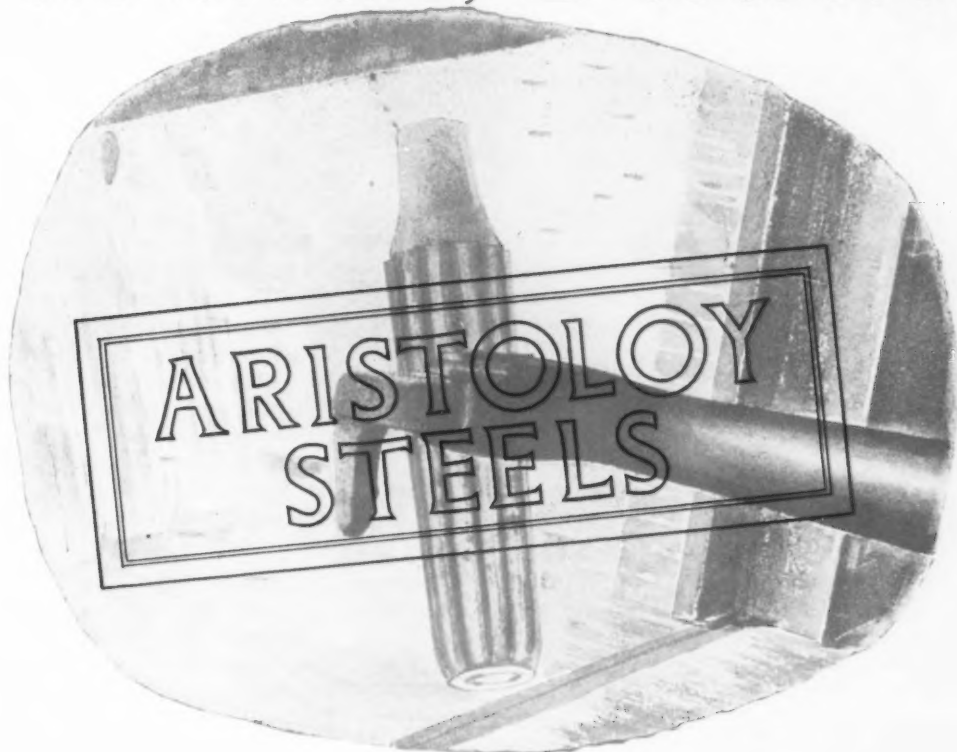


Turning Nitralloy steel cylinder barrels (230-240 Brinell) for "Cyclone" engines at Wright Aeronautical Corp. Speed, 200 ft. per min.

carbide tools

McKENNA METALS Co.
144 LLOYD AVENUE
LATROBE, PENNSYLVANIA, U.S.A.

The name, "Aristoloy"---



A PROMISE TO YOU; A CHALLENGE TO US

THE name "ARISTOLOY" derived from "aristos", the Greek root of "aristocrat" means *the finest in alloy steels*. To keep the promise and meet the challenge in this name the Copperweld Steel Company has assembled an organization of steel makers who have been making alloy steel for you for 25 years. Operating in a new plant equipped with the latest and best in steel making equipment these men can make every bit of their long experience count. They will answer our challenge, and keep our promise to you that Aristoloy Steels are the best in alloy steels.

COPPERWELD STEEL COMPANY

Warren, Ohio



**ARISTOLOY
STEELS**

ARISTOLOY: S. A. E. ALLOY BILLETS AND BARS, AIRCRAFT QUALITY STEELS,
OXIDATION AND CORROSION RESISTING STEELS, TOOL AND SPECIAL STEELS, STAINLESS STEELS

siderable thought to possible requirements and has made plans for developing processes to meet defense needs. Large part of production will come from petroleum industry which has never before produced this material commercially.

Chemical industry: The Army and Navy Munitions Board has set up 15 divisions of the chemical industry to study requirements to meet demands. Our chemical division is working with the Munitions Board in this connection. Each of the 15 divisions represents leaders in the respective field. Meetings have been held and are directed toward the end of translating objectives into production. Competing units of the industry with necessarily secret formulas and processes have openly discussed their plans with us. Offers have been made to exchange information with competing units to facilitate the program.

Mr. Stettinius emphasized that the corporation received from the

Army, Navy, RFC, Treasury and numerous other departments and offices of the government, together with the generous response of industry has "immeasurably aided the efforts of this division." He said the division has had a "gratifying response from industry which is making available to us vital and most confidential information from mines, mills and factories and research laboratories as well."

Speaking of the administration's proposed 5-yr. amortization formula which is to be written into the excess profits tax bill, Mr. Stettinius said it ought to give industry "the needed elbow room."

Correction

In the July 11 "Assembly Line" the word "two" was dropped from the second line of the paragraph "The 2-in. gold disc, emblematic of high British engineering regard, has been awarded only to two men, and Ford is the only living holder of it."

Metal Exposition In West on May 19

Cleveland

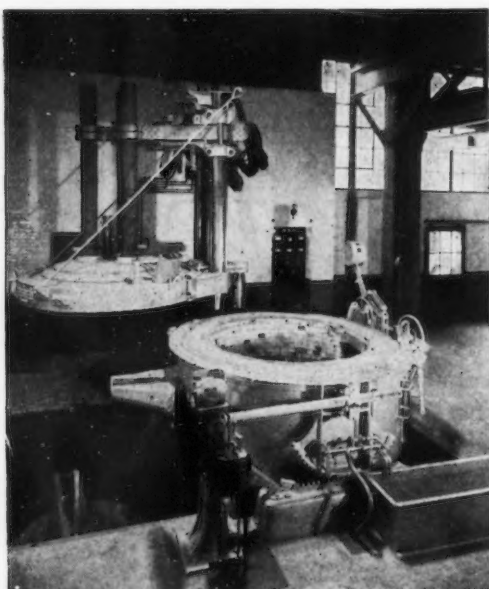
••• The American Society for Metals has decided to hold the fourth Western Metal Congress and Western Metal Exposition in Los Angeles the week of May 19, 1941.

"The tremendous increase in industrial activity in the West, together with the extensive growth of the aeronautical industry and the fact that three years will have elapsed since the previous convention, caused the board to feel that 1941 should be an advantageous and propitious year for another western event," said W. H. Eisenman, managing director of the congress, in announcing the decision.

The Los Angeles Chapter of A.S.M. has already organized a general committee and is making plans for another outstanding Congress. The exposition will again be held in the Pan-American Auditorium.

The Los Angeles committee in charge of the congress and exposition is: General chairman, A. G. Zima, International Nickel Co.; general vice-chairman, B. H. Brown, Bethlehem Steel Co.; general secretary, W. J. Parsons, Pacific Scientific Co.; exhibit committee, W. W. Farrar, Farrar Industrial Products Co., chairman; C. E. Burt, Baker Oil Tools, Inc., vice-chairman; James H. Knapp, Knapp Furnace Co., vice-chairman.

Program committee, D. C. Clark, California Institute of Technology, chairman; G. A. Gallagher, Los Angeles Junior College, vice-chairman; publicity committee, W. A. DeRidder, General Metals Corp., chairman; information and registration committee, J. E. Wilson, Climax-Molybdenum Co., chairman; attendance committee, H. R. Abey, Leeds & Northrup Co., chairman; entertainment committee, Harold Etter, Air Reduction Sales Co., chairman; cooperating committee of technical societies, P. D. McElfish, Standard Oil Company of California, chairman. Floor plans for the exposition will be ready for distribution Sept. 1.



USE
MOORE RAPID
Lectromelt
FURNACES
for
MELTING
REFINING
SMELTING

Illustration shows top charge type LECTROMELT furnace with roof raised and rotated to one side to permit quick charging with drop bottom bucket.

LECTROMELT furnaces offer the rapid and economic means for the production of plain carbon and alloy steel ingots and castings as well as gray and malleable irons. Top charge and door charge types are both available. LECTROMELT furnaces are built in standard capacities from 25 pounds to 100 tons. Write for details.

PITTSBURGH LECTROMELT FURNACE CORP.
Foot 32nd St. Pittsburgh, Pa.

MONARCH'S
8-POINT
PLATFORM
for
Forward Looking
AMERICA



POINT 1 OF MONARCH'S PLATFORM ...

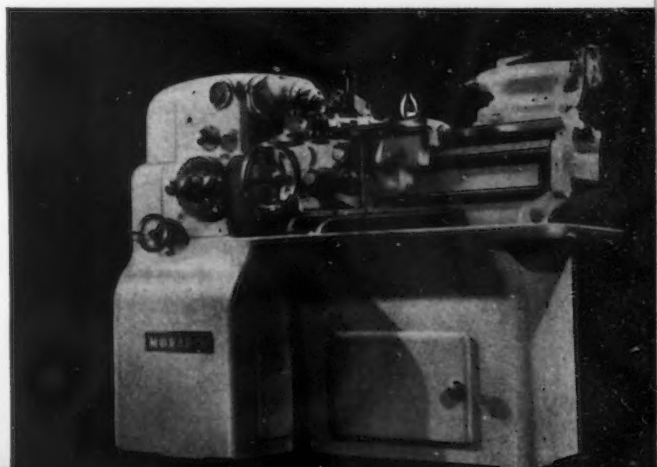
INDUSTRY SHOULD CREATE ITS OWN NEW FRONTIERS

BROAD, new frontiers for industry loom over the horizon . . . frontiers that open up new vistas of advanced products and new-technique processes. As in the past, industry will continue to create its own frontiers . . . will never be content to accept a static condition . . . will blaze the trail with new developments which will continue to raise the American standard of living.

To do this, industry needs new tools . . . better, faster and more efficient methods of production . . . in order to produce more goods for more people at lower cost.

Monarch builds lathes for today's requirements . . . designs them in anticipation of tomorrow's demand. When the new frontiers open up, Monarch will be ready, as always, to supply industry with machines geared to the fast-accelerating tempo of a new industrial age. The Monarch Machine Tool Company, Sidney, Ohio.

Monarch's Up-To-The-Minute 10" x 20" Sensitive Precision Tool Maker's Lathe



MONARCH LATHES

5 More Billions For Armed Forces

Washington

••• A White House request for another \$4,848,171,957 for further expansion of the military and naval forces and Congressional passage of a bill to provide a 70 per cent expansion of the Navy estimated to cost an ultimate \$10,000,000,000 last week highlighted defense developments.

Mr. Roosevelt asked that \$2,161,441,957 be made available in the form of immediate cash outlays for the current fiscal year, and \$2,686,730,000 in contract authorization—sums which if approved will bring the total amount voted by the present Congress for national defense purposes to \$9,930,382,037. Broken down further, the defense recommendations asked \$1,662,265,417 in cash and \$2,249,730,000 in contract authorizations for the Army, and \$499,176,540 in



C. F. HOOD, president of American Steel & Wire Co., is shown here, center, with two 50-year veterans of the company's Donora, Pa., mills. They are, left, John W. Pickford, a blooming mill foreman, and, right, Carl A. Johnson, a watchman.

cash and \$437,000,000 in contract authorizations for the Navy.

The President set forth these immediate objectives in a special message, read to both houses of Congress just five days before the opening session of the Democratic convention in Chicago:

1. To provide naval expansion

to meet any possible combination of hostile naval forces.

2. To complete the total equipment for a land force of approximately 1,200,000, though this total of men would not be in the Army in time of peace.

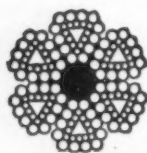
3. To procure reserve stocks of tanks, guns, artillery, ammunition, for another 800,000 men or a total of 2,000,000 men if a mobilization of such a force becomes necessary.

4. To provide for manufacturing facilities, public and private, necessary to produce critical items of equipment required for a land force of 2,000,000 men, and to produce the ordnance items required for the aircraft program of the Army and Navy—guns, bombs, armor, bombsights and ammunition.

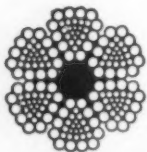
5. Procurement of 15,000 additional planes for the Army and 4000 for the Navy, complete with necessary spare engines, armaments, and the most modern equipment.

Estimates made since the Presidential message show these items envisioned by the \$4,848,171,957 program:

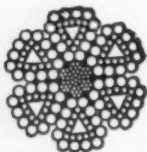
To begin construction on 1,534,000 tons of combat ships and 175,000 tons of auxiliary ships, \$93,000,000; to equip these combat ships with armor, guns and ammunition, \$85,000,000; for alterations to naval vessels, \$75,000,000; for the Army air corps, \$1,533,402,204; for naval airplanes, \$500,000,000; for speeding production of equipment and supplies for the Army and for training civilian personnel in its production, use, operation and maintenance, \$325,000,000; for



Style B
Flattened Strand



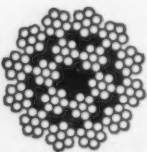
"B"
Flattened Strand



Wire Rope Center



Steel Clad



18x7
Non-Rotating

You Can Depend On "HERCULES"* (Red-Strand) Wire Rope...

There is no guesswork when you use "HERCULES" (Red-Strand) Wire Rope. It is designed and built to do specific jobs better . . . safer . . . more economically. Furnished in a wide variety of constructions so as to be suitable for all purposes—each backed by 81 years of manufacturing experience and close co-operation with users.

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For maximum efficiency in Preformed Wire Rope, use Preformed "HERCULES". It is available in both Round Strand and Flattened Strand constructions.

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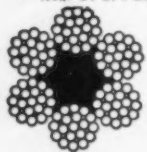
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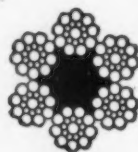
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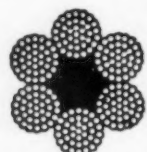
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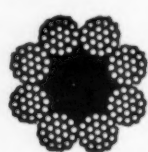
6x19
Filler Wire



6x19
Scale



6x37
Extra Flexible



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Extra Flexible

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Have been built and advertised in increasingly larger sizes to meet our customers' requirements. As the size of the machine increases, design of complete facilities for easy roll changeover becomes more important. This feature, as well as ease of adjustment, accessibility, rigidity of construction and speed synchronization, has been dealt with in accordance with modern engineering principles to meet our customers' particular conditions.

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AS ILLUSTRATED IS DESIGNED TO PRODUCE MECHANICAL TUBING, IN A SIZE RANGE FROM $2\frac{3}{8}$ " OD TO $4\frac{1}{2}$ " OD—MAXIMUM WALL THICKNESS $\frac{1}{4}$ ".

CUTOFF

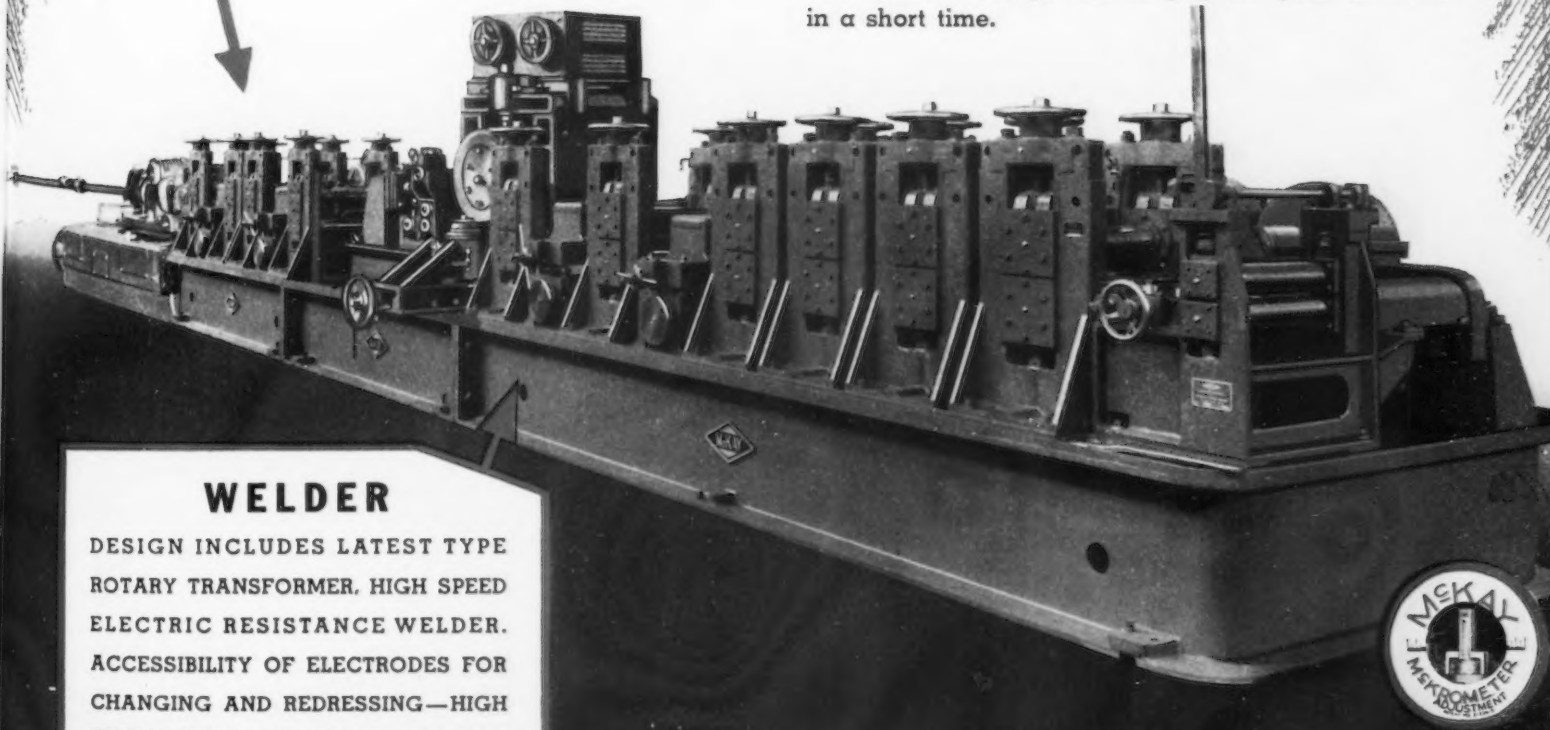
MACHINES AVAILABLE IN TYPES TO SUIT YOUR REQUIREMENTS.

CALL ON US FOR INFORMATION

and prices on equipment to suit your particular conditions. Savings should pay for your machine in a short time.

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DESIGN INCLUDES LATEST TYPE ROTARY TRANSFORMER, HIGH SPEED ELECTRIC RESISTANCE WELDER. ACCESSIBILITY OF ELECTRODES FOR CHANGING AND REDRESSING—HIGH EFFICIENCY AND POWER FACTOR ARE CHARACTERISTICS INHERENT IN THIS CONSTRUCTION.



THE McKAY MACHINE CO.

Engineers and Manufacturers of
SHEET, TIN AND STRIP MILL EQUIPMENT
YOUNGSTOWN, OHIO

sea coast defenses, \$36,633,491; for the signal corps, \$106,246,752; for the chemical warfare service, \$27,428,641; for construction work at undesignated military posts, \$82,001,915.

The approved naval bill providing for a two-ocean navy is aimed at bringing naval strength up to 3,049,480 tons by 1949—a naval force far in excess to that of any other single country. The Navy Department would be given considerable latitude in assigning tonnage of individual ships, as well as a discretionary power to shift tonnage from one classification to another within certain limits.

The bill, an authorization measure as distinguished from an appropriation bill, contemplates a distribution of naval tonnage roughly as follows: Battleships, 1,045,000 tons displacement; aircraft carriers, 454,500 tons; cruisers, 899,024 tons; destroyers, 478,000 tons; submarines, 172,956 tons.

Carrier Employees Are Warned of Fifth Column

... Employees of Carrier Corp. manufacturer of air conditioning equipment, were told recently by J. I. Lyle, president, to "see that there is no sabotage or fifth column in our plant or organization." When any suspicion arises we should "act promptly and effectively," he said.

The rearming program is going to put back to work every able-bodied citizen who desires to work, Mr. Lyle said.

A 70 per cent increase in naval strength, it had previously been estimated, would cost around \$4,000,000,000, but Senator Walsh, chairman of the Senate Naval Affairs Committee, hiked this estimate to \$10,000,000,000 during Senate debate on the measure. He based his calculations on these estimates:

Cost of constructing ships contemplated by the bill, \$3,760,000,000; cost of additional shipbuilding, armor and ordnance facilities \$250,000,000; additional appropriations required to complete vessels now under construction, \$2,800,000,000; cost of procuring additional planes authorized by the bill, \$600,000,000; additional planes already authorized \$1,150,000,000; additional shore facilities, \$410,000,000; training of pilots, \$90,000,000; procurement and training of additional personnel \$300,000,000; ordnance equipment, bombs, torpedoes, ammunition, \$300,000,000.

10 Barges Ordered for Coal, Coke Shipments

Pittsburgh

... The Semet-Solvay Co., New York, has placed an order with the Hillman Barge & Construction Co., Pittsburgh, for 10 welded steel "Kennedy" type barges for movement of coke or coal on the Ohio and Kanawha Rivers. Each carrier will be 175 ft. long, 26 ft. wide, and 11 ft. deep. Approximately 1500 tons of steel shapes and plates will be required.

Hunter Steel Co. will fabricate the barges at its Neville Island plant and then they will be assembled at the Hillman ship yard near Brownsville, Pa. Delivery is to be made in September and October. Semet-Solvay Co. has also ordered a new towboat which is now being built by the Dravo Corp.

Brazil Buys More Machinery from U. S.

Washington

... The European war, improving substantially the position of United States industrial machinery in the Brazilian market and eliminating Germany as a supplier, is cited in a report to the Commerce Department from Rio de Janeiro as responsible for increasing machinery imports from the United States, more than 50 per cent in 1939 with the ratio of American participation advancing from 24 to 42 per cent from 1938 to 1939. During 1939, the report said, imports of industrial machinery items showed a decline of 10 per cent.



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from EVERY TYPE of Wire up to and including 1/2" diameter

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Years of practical experience, plus equipment that is suited to our needs places us in a position to efficiently fill all orders for wire forms, snap rings, small stampings and flat, coil or special springs.

SEND FOR QUOTATIONS

AMERICAN SPRING & MFG. CORP.
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Planes Ordered, Next Step up to Industry, Defense Advisor Says

Washington

•••The National Defense Advisory Commission, showing signs of being irked at persistent reports of an administration lag in converting Congressional appropriations into defense contracts with industry, passed the word along last week through its highly important aeronautics division that since July 3 more than \$100,000,000 in aircraft contracts have been cleared through the commission; that additional contracts are in the mill under a well-planned two-year program expected to provide 25,000 planes by July 1, 1942 and that so far as its work relates to aircraft expansion "the next job in line is one for industry to handle."

In the first press conference to be held by an official of the agen-

cy, George J. Mead, bespectacled, mild-mannered former vice-president of the United Aircraft Corp., of Hartford, Conn., said that his division has been able to accomplish everything it set out to do and that its progress to date has been good "considering the magnitude of the task." He conceded, however, that the question of amortization was a serious "stumbling-block" prior to the White House announcement on July 10 that an amortization plan over a five-year period for additional facilities would be incorporated in the new excess profits tax bill.

Dr. Mead, full-time aeronautics adviser to Commission Member William S. Knudsen in charge of production, answered questions for almost an hour in the heavy-

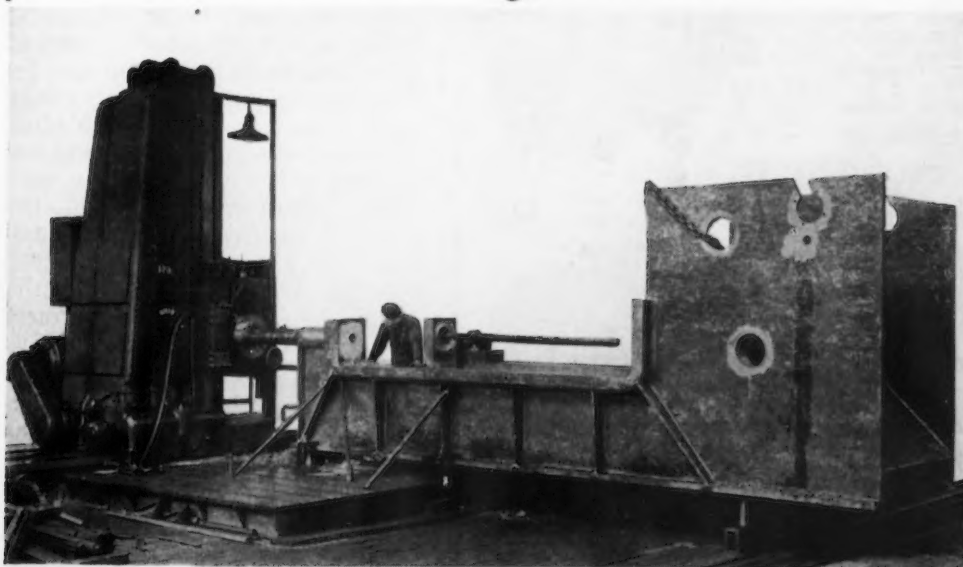
carpeted governor's conference room in the Federal Reserve Building, and went out of his way to minimize the frequently-repeated statement that the advisory commission lacks authority to do its assigned job.

"Everyone talks about our lack of power but that isn't holding us up. We can go across the street and get all the power we need," Dr. Mead said, pointing across Constitution Avenue to the buildings housing the War and Navy Departments.

The commission's aeronautics division, whose work will be outstanding in the functioning of the defense commission if emphasis is placed on the air power expansion believed warranted by European developments, has the job of coordinating the air-expansion activities of the Army and Navy but not to supersede them. Dr. Mead's division plans to maintain only a small staff.

"The military requirements of

"Ohio Horizontals"



MINIMIZE handling of large work during process of production.



The Cleveland Crane & Engineering Company depend on "OHIO HORIZONTALS" for machining their large "Steelweld" Bulldozer and Press Brake frames.

Built in table and floor type with a complete range of attachments. Write for a bulletin.

THE OHIO MACHINE TOOL CO.

KENTON, OHIO

MANUFACTURERS OF

SHAPERS **OHIO DREADNAUGHT** PLANERS
HORIZONTAL BORING, DRILLING and MILLING MACHINES

the country are not defined by the defense commission," Dr. Mead said in elaboration. "Its job is to facilitate production and coordinate requirements specified by the War and Navy Departments; but its assigned job does not involve replacing Army and Navy functions. Rather, it is an agency for assisting in providing them with what they say they need."

The aircraft phase of the de-

fense program, as described by Dr. Mead, shapes up like this:

The job, involving a hundred-fold increase over the air expansion program contemplated a year ago, is already on paper ready to go. Since conferences early this month with commission members, War and Navy Department officials and representatives of industry, more than \$100,000,000 in aircraft contracts have been placed

Defense Board Seeks Lower Plane Prices

Washington

The aircraft industry is being circularized by the National Defense Commission in an effort to learn if prices can be shaved by giving plants a definite idea of quantities to be ordered, and to ascertain what additional facilities will be required to produce a given number of planes. The commission, seeking the lowest possible price consistent with the job required to be done on the quantities ordered, hopes that the higher prices being paid for greater speed will be offset by assuring companies sufficient orders to equip themselves for quantity production.



Bring Your POWER TRANSMISSION Problems to *Stearns* **MAGNETIC**

For safely, economically and efficiently transmitting stops and starts by accurate near or remote control there is a STEARNS Magnetic Clutch or Brake or Clutch and Brake combination in size or design to adequately take care of your problem.

We are pioneers in the development and application of magnetic friction devices of all types. Our many years of practical experience in the manufacture of magnetic equipment is available to you.

What's your problem? Whether in your plant or product—we invite your inquiry. No obligation. Write for our Bulletin 225 on magnetic clutches or Bulletin 604 on magnetic brakes.

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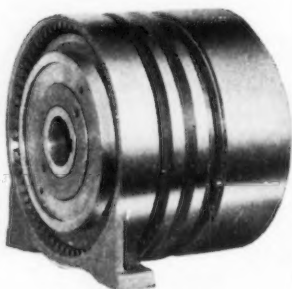
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Magnetic clutch on through shaft, loose pulley application



Magnetic clutch-brake combination



A.C. or D.C. Magnetic brakes for motor or machine mounting

under a "well balanced" program involving the construction of only "proven types of equipment for large-scale production."

Contracts covering the balance of funds made available by Congress are now being negotiated under a new procedure approved by Congress to speed up the defense program by dispensing with the usual competitive bidding practices. It is expected that, including the \$100,000,000 in contracts awarded since July 1, the program will result in the acquisition of 25,000 planes—about 17,000 for the Army and 8000 for the Navy—by July 1, 1942. Contracts will be made within four or five months.

While the value of future design changes, incorporating improvements found essential in the light of experience, is not being overlooked, the 25,000 planes will follow a "frozen" design, from which no deviation will be made. Engineering efforts will be concentrated on the basis of Army and Navy requirements but all "unnecessary" engineering work will be halted.

Defense experts are relying heavily upon the two large aeronautical laboratories to be maintained by the National Advisory

Committee on Aeronautics. The work of the laboratory at Langley Field, Va., already has attracted world-wide attention. A new and larger laboratory is under construction at Sunnyvale, Cal., and under a \$8,400,000 appropriation contained in a recently-approved appropriation measure a new laboratory to be devoted exclusively to aircraft engine engineering and development will be constructed at an undetermined location. This development is expected to put the country's aircraft engineering facilities on a par with Germany.

Both the Army and Navy, which heretofore have had their own construction and testing specifications, have agreed to a standardized procedure for handling contracts and to adopt uniform technical requirements. Greater standardization is the watchword for all materials going into aircraft construction, including stainless steel, finishes, final inspection and other details. Also being studied is the question of whether, as intimated in some quarters, the policy of aircraft designers in this country has been to make engine specifications for combat planes too rigid. In this connection, all factors bearing on the question of ways to speed up production are being thoroughly analyzed, and whether tolerances will be relaxed in the interest of accelerating manufacturing methods without sacrificing sound engineering essentials is under close scrutiny.

In planning a program of this size, the commission is cognizant that plant capacities above ordinary needs will be necessary. As a phase of the program to provide costs, Mr. Knudsen has had conferences with Federal Loan Administrator Jesse Jones, under which a plan is being worked out to get loans from the Reconstruction Finance Corp. to finance the construction of necessary additional facilities.

Although the RFC has made loans totaling \$15,000,000 to business for defense purposes, it has declined to estimate how much will be needed for the aircraft and other arms expansion. Mr. Jones likewise has turned down requests to make public rules of amortization or payment of defense loans, insisting that the RFC policy will be to treat each loan separately.

Heppenstall Co. to Expand Its Plant

Pittsburgh

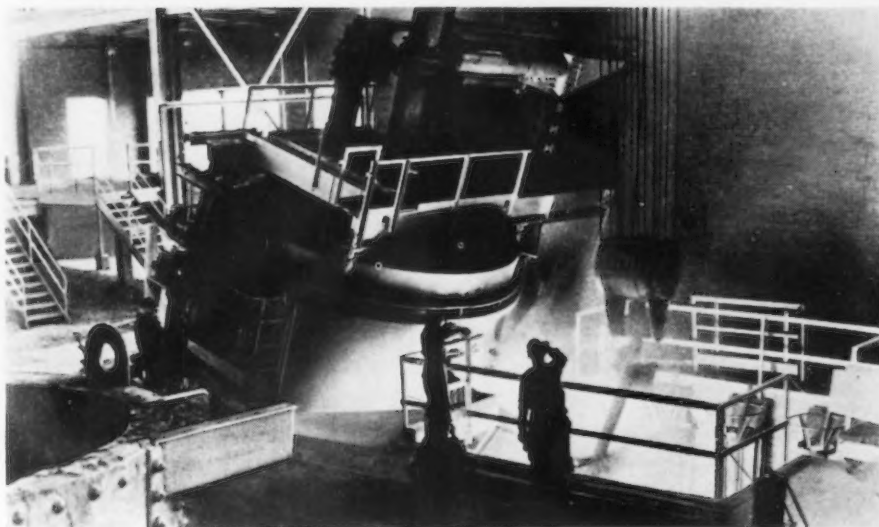
• • • The Heppenstall Co. is planning to enlarge its plant to provide more space for work on Army and Navy orders. The company has asked the Pittsburgh City Council to vacate two seldom used 9 ft. sidewalks along the two streets adjoining the plant.

Lambert Machine Tool Leases More Space

Cleveland

• • • Orders necessitating expansion by the Lambert Machine Tool Co., 1412 East 25 Street, have resulted in a lease taken by that company on a building at 1850 East 18 Street, with 3000 additional square feet of floor space for manufacturing of boring mills.

AN EXAMPLE



OF A
MODERN INSTALLATION
OF
HIGH CAPACITY

SWINDELL

ELECTRIC ARC MELTING
FURNACES

THE PHOTOGRAPH SHOWS ONE OF A PAIR OF 16'-0" SWINDELL SWINGING-ROOF ELECTRIC ARC MELTING FURNACES, EACH OF 35-TON CAPACITY, AT THE COPPERWELD STEEL CO., WARREN, OHIO

SWINDELL SWINGING ROOF
FURNACES

PRODUCE HIGH-GRADE STEEL
AT LOWEST COST

SWINDELL-DRESSLER CORPORATION
PITTSBURGH, PA.

Canada Expanding War Purchases; Machinery Orders Placed in U. S.

Toronto

• • • Canadian industry is putting its full force behind the Empire's war effort and to further augment production of war materials of every nature, production capacity

is being increased at a rapid rate with the cooperation of the Canadian and British governments.

One of the major problems in the speeding up of activities is the scarcity of skilled labor. So far

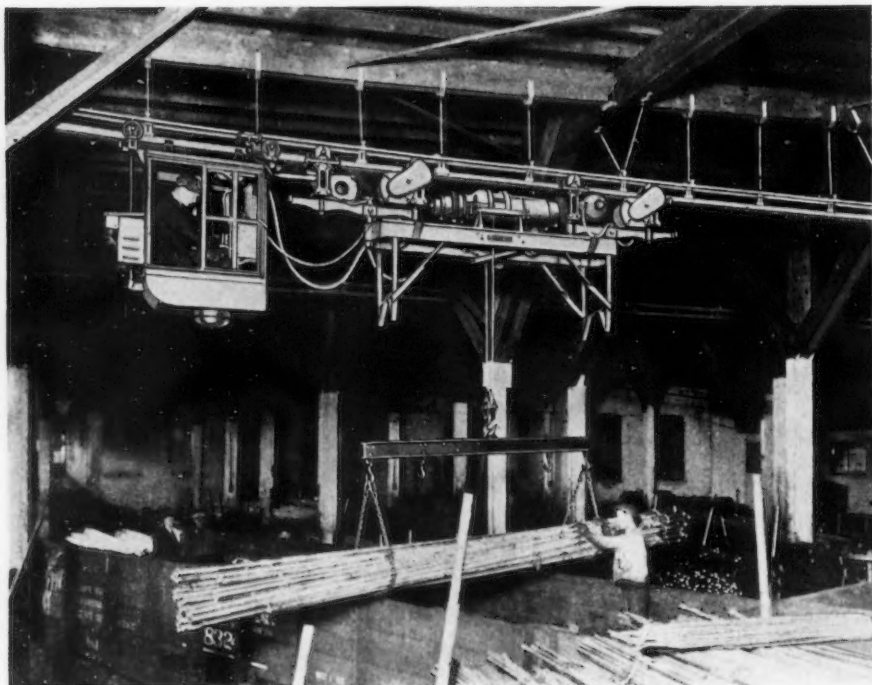
there has been comparatively little effort toward training new men. However, now that the government is empowered to conscript man-power, there is a possibility that something may be done soon with regard to the labor problem. There is an abundance of unskilled labor available in the Dominion which in time could be put in shape to meet all requirements of industry.

Industrial employment now is at the highest level since 1929, and the new department of National War Services has been formed to employ the draft to make sure there will be an adequate supply of labor to increase industrial production as it may become necessary.

Construction work has just been started on a large munitions plant on the Island of Montreal, Department of Munitions and Supply announced. The new plant, which will produce brass at a rate of tens of thousands of tons annually, is being erected by the Canada Wire & Cable Co., Ltd., at a cost of \$2,000,000. Both the plant and equipment will be owned by the Canadian government but will be operated by the Canada Wire & Cable Co., Ltd.

Lt.-Col. H. D. Fearman, civic industrial commissioner for Hamilton, Ont., advises that representatives of British industries have been in Hamilton during the past two weeks, investigating the possibilities of establishing plants. He stated there are a number of British companies considering location of plants in Canada, adding the British manufacturers might not move their entire plants to the Dominion, but are likely to decentralize their activities.

The Allied Supplies, Ltd., a government-owned company, has been set up to administer the production of munitions and explosives program undertaken on behalf of the British government, Prime Minister Mackenzie King, announced. The company is one of three government owned and non-profit making organizations set up to carry on special phases of the work of the production of munitions and other war supplies. The others are Citadel Merchandising Co., Ltd., which is concerned with the supply of machine tools and other equipment, and the Federal



SAVES HOURS OF HANDLING TIME ... every day!

With a Cleveland Tramrail system (as illustrated) bar steel and pipe can be removed quickly and easily from railroad cars and placed directly into stock. The same system delivers materials from stock to point of work in fast time with no rehandling.

Cleveland Tramrail electrically-driven cab-controlled systems greatly increase the amount of materials that can be handled with the same stock men. In busy plants they save many hours of handling time every day.

It will pay you to investigate Cleveland Tramrail.



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THE CLEVELAND CRANE & ENGINEERING CO.
1115 Depot Street Wickliffe, Ohio

CLEVELAND TRAMRAIL

OVERHEAD MATERIALS HANDLING EQUIPMENT

Other products: CLEVELAND CRANES and STEELWELD MACHINERY

Aircraft, Ltd., organized to coordinate the output of parts for and speed production of aircraft.

War orders being placed in Canada at this time, both by the Canadian and British governments, are on the largest scale since the beginning of the war. During the first week of this month announcement was made that the British

firm, is being converted exclusively to the production of guns and war materials for Great Britain and Canada. The original purpose of this plant, which was constructed at cost of \$10,000,000 was to produce field guns and such other materials as might be required for France, Britain and Canada.

Car Co., Ltd., Hamilton, Ont., \$58,833.

Machinery and tools — Canadian Fairbanks-Morse Co., Ltd., Ottawa, \$6,007; Allatte Machine & Tool Co., Toronto, \$5,580; E. W. Bliss Co., Toronto, \$748,599; Delamore & Williams, Toronto, \$16,200; A. R. Williams Co., Ltd., Toronto, \$145,990; J. E. Livingstone & Co., Ltd., Windsor, Ont., \$13,110; Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., \$213,627.

Electrical equipment — Canadian Westinghouse Co., Ottawa, \$40,548; Outboard Marine Mfg. Co., Ltd., Peterboro, Ont., \$38,961; Sutton Horsley Co., Toronto, \$32,400; Commonwealth Electric Corp., Welland, Ont., \$44,931; British Air Ministry, England, \$297,000.

Munitions — British Metal Corp., Montreal, \$48,088; Consolidated Mining & Smelting Co., Ltd., Montreal, \$111,500; Merck & Co., Ltd., Montreal, \$20,400; E. Leonard & Sons, Ltd., London, Ont., \$43,485; Winchester Repeating Arms Co., East Alton, Ill., \$74,778.

Mechanical transport — General Motors Products of Canada, Ltd., Oshawa, \$14,201; LaFrance Fire Engine & Foamite Co., Ltd., Toronto, \$142,464; B. F. Goodrich Rubber Co., Ltd., Kitchener, Ont., \$48,000.

Navy Contracts On Cost-Fixed-Fee Basis

Washington

Negotiated contracts estimated at \$136,744,000 have been awarded by the Navy Department on a cost-plus-fixed-fee basis as follows, each figure being an estimate:

Naval Air Station, Pensacola, Fla., aviation facilities, Hardaway Contracting Co., Columbus, Ga., \$4,000,000; Naval Air Station, Miami (Opa Locka), Fla., aviation facilities, Fred Howland, Inc., and Jack Quinn, Inc., Miami, \$3,500,000; Naval Air Station, Jacksonville, Fla., aviation facilities, Duval Engineering & Contracting Co., Jacksonville, The George D. Auchter Co., Jacksonville, Batson-Cook Co., West Point, \$12,786,000; Naval proving ground, Dahlgren, Va., hangar, etc., Jeffress-Dyer Co., Washington, D. C., \$225,000; Naval hospital, Norfolk, Va.; hospital wards, Weddle & Co., Norfolk, \$165,000; Naval training station, Newport, R. I., explosive-manufacturing building and store house, the Tredennick-Billings Co., Boston, \$585,000; Norfolk, aviation



THIS PHOTOGRAPH shows what a steel house looks like after eight years. Built in Cleveland in 1932 by Ferro Enamel Corp., this porcelain-on-enamel dwelling is holding up satisfactorily, according to Charles Bacon Rowley Associates, Inc., Cleveland architects. On only a few shingles, cut so as to leave a raw edge, is there any evidence of rust.

government placed orders for munitions and war supplies on this continent totaling \$100,000,000 and additional contracts are being prepared. Total amount spent to date by Great Britain for purchase of aircraft and aircraft parts in Canada is reported at \$50,000,000, and from now on Canadian aircraft industry is assured of orders covering its entire production. Hon. C. D. Howe, Minister of Munitions and Supply, Ottawa, states that the British government is placing immediately further large orders for munitions in Canada. The orders which are to be placed immediately, Mr. Howe states, will expand materially the already extensive British munitions program in Canada.

The plant at Sorel, Que., launched by Marine Industries, Ltd., with cooperation of Schneider-Creuzot, the French armament

The Canadian government, through the Department of Munitions and Supply, is maintaining its high rate of contract placing for war needs. Announcement is made that the Canadian government last week placed an order with the Menasco Mfg. Co., Los Angeles, Cal., U. S. A., for 400 airplane engines. The engines are for installation in training planes being manufactured in Canada on which delivery is planned to start next month.

During the past week Department of Munitions and Supply, placed 1206 contracts with total value of \$8,261,266. The more important orders were placed as follows:

Aircraft supplies — Instruments, Ltd., Ottawa, \$206,306; Irvin Air Chute, Ltd., Ottawa, \$168,699; Ontario Hughes-Owens Co., Ottawa, \$1,072,556; Ottawa Car & Aircraft, Ltd., Ottawa, \$131,950; National Steel

shore facilities, Virginia Engineering Co., Inc., Newport News, Va., \$12,700,000; Navy Yard, New York, storehouse, Turner Construction Co., New York, \$4,000,000; Coco Solo, Canal Zone, aviation facilities, Lindgren & Swinnerton Inc., San Francisco; Hegeman-Harris Co., Inc., New York, Tucker McClure, Balboa, \$11,050,000; naval air station, Alameda, Cal., aviation facilities, Johnson, Drake & Piper, Inc., Minneapolis, \$9,800,000; naval training station, Newport, barracks and mess hall, Platt Contracting Co., Inc., Boston, \$400,000; naval air station, Guantanamo Bay, Cuba, defense and aviation facilities, Frederick Snare Corp., New York, \$5,190,000; Western Pacific: Pearl Harbor and islands in Pacific, aviation facilities, buildings, fuel storage, dredging, etc., Hawaiian Dredging Co., Ltd., Honolulu, T. H.; Raymond Concrete Pile Co., New York; Turner Construction Co., New York; Morrison-Knudsen Co., Inc., Los Angeles; J. H. Pomeroy & Co., Inc., San Francisco, \$30,870,000; Naval Air Station, Quonset Point, R. I., aviation shore facilities, George A. Fuller Co., New York; Merritt-Chapman & Scott Corp., New York, \$24,204,000; navy yard, Philadelphia, battery overhaul shop, Hughes-Foulkrod Co., Philadelphia, \$75,000; naval operating base, San Diego, Cal., marine corps barracks, the Los Angeles Contracting Co., Los Angeles, \$1,630,000; navy yard, Norfolk, machine-shop extension and cafeteria, Rust Engineering Co., Pittsburgh, \$720,000; naval operating base, San Diego, aviation facilities, M. H. Golden and Walter Treppe, Los Angeles, \$3,313,900; navy yard, New York, alterations to Shipways No. 1, and armored deck facilities, J. Rich Steers, Inc., New York, \$1,775,000; navy yard, Charleston, S. C., storehouse, lockers, cafeteria, pipe shop, Simons-Marrant Co., Charleston, \$390,000; Puget Sound area, Wash.; aviation, fuel-oil, ammunition-storage facilities, the Austin Co., Cleveland, \$7,300,000; navy yard, New York, Iona Island, N. Y., power plant improvements, the J. G. White Engineering Corp., New York, \$740,000; navy yard, Boston, submarine base, New London, Conn., power plant improvements, Stone & Webster Engineering Corp., New York, \$1,325,000.

Railroads' Needs Again Disputed

Washington

• • • The old question of whether or not the railroads are in need of a large volume of new equipment has been revived. From time to time the administration has attempted without success to have the railroads, through the use of RFC funds, enter upon a vast purchase program. Administration

C-I Orders Cold Reduction Mill

Pittsburgh

Carnegie - Illinois Steel Corp. has placed a contract with Mesta Machine Co. for a 48-in. five stand tandem four-high cold reduction mill and another contract for two 48-in. four-high temper pass mills. These mills are being ordered as part of Carnegie's construction program to increase tin plate production capacity at its Irvin works (THE IRON AGE, April 18, p. 81F). Orders have not yet been placed for shearing and cleaning lines, nor has supplementary equipment been ordered for the Gary works expansion.

sources, in the face of denial by the railroads, have insisted that the transportation plant is inadequate. The suggestion also emphasized the pump priming features of the project. Now that national defense has taken the spotlight, it is urged that many new cars and locomotives are needed if the railroads are to be efficiently mobilized.

Some time ago the National Resources Planning Board came out with recommendations that the railroads purchase 500,000 new cars and 2000 locomotives as rap-

idly as they can be built. The estimated expenditure was \$1,250,000,000. The recommendations were prepared by R. N. Janeway, Chrysler Corp. economist.

The recommendations had been rejected by Ralph Budd, transportation member of the National Defense Advisory Commission and president of the Chicago, Burlington & Quincy railroad, it was reported. RFC Administrator Jesse Jones, sharing the railroad position but differing with other administration sources, expressed the belief that the railroads are adequately equipped to meet national defense demands. He said he had not read the Janeway report. Mr. Budd declined to comment publicly on the report. But he is said to have told executives of the Association of American Railroads at a meeting in Chicago on June 18 that there is all the transportation that is needed at present and more. In discussing the Janeway survey, Mr. Budd is said to have pointed out that general analyses are not sufficiently reliable and that each railroad should first analyze its individual problems respecting repair of old and purchase of new equipment.

The Car Service Division of the Association of American Railroads recently surveyed the car situation. Reports to the division together with replies by member roads to letters sent out May 16-26 by President Pelley of the association disclose the following:

Prospective additional serviceable cars on Oct. 1, 1940, over Oct. 1, 1939—147,097.

Number of new cars that will have been installed by Oct. 1, 1940, since Jan. 1, 1936, exclusive of new orders that may be placed up to Oct. 1—213,389.

Cars on order June 1, 1940, 35,435 plus number not then reported to Car Service Division, compared with 9261 on June 1, 1939.

Increase in serviceable cars on June 1, 1940, over Oct., 1939—39,527.

Cars on order June 1, 1940—15,039.

Cars to be rebuilt—12,985.

Government Orders

Washington

••• Federal contracts for iron and steel products, as reported for the week ended July 6 by the Labor Department's Public Contracts Division, totaled \$2,177,649. For the same period, contracts were reported aggregating \$276,523 for non-ferrous metals and alloys and \$959,710 for machinery. Details follow:

Iron and Steel Products

Allegheny Ludlum Steel Corp., Brackenridge, Pa., steel, \$13,760; Edgewater Steel Co., Pittsburgh, steel forgings, \$15,538; George D. Ellis & Son, Inc., Philadelphia, containers, \$10,264; Russakov Can Co., Chicago, steel containers, \$17,150; Railway & Industrial Engineering Co., Greensburg, Pa., structure for substation, \$17,095; Babcock Printing Press Corp., New London, Conn., machined shell, \$183,131; American Car & Foundry Co., Berwick, Pa., suspension parts, \$33,018; Surface Combustion Corp., Toledo, soaking furnace, \$15,100; United States Steel Export Co., gates, \$872,264; The Steel Products Engineering Co., Springfield, Ohio, cabinet assemblies, \$16,012; The Clauss Shear Co., Fremont, Ohio, bandage scissors, \$22,740; J. J. Koepsell Co., Sheboygan, Wis., conduit pipe, \$17,543; Edgewater Steel Co., Pittsburgh, roller paths, \$15,050; R. P. Clarke Co., Washington, D. C., steel shears, \$12,285; Trimont Mfg. Co., Boston, wrenches, \$19,207; National Tube Co., McKeesport, Pa., steel flasks, \$57,690; Doehler Die Casting Co., Pottstown, Pa., practice bombs, \$19,140; Apollo Steel Co., Apollo, Pa., corrugated roofing, \$95,369; Boston Wire Stitcher Co., East Greenwich, R. I., wire staples, \$38,250; American Forge Division of The American Brake Shoe and Foundry Co., Chicago, forgings for shells, \$70,235; Bethlehem Steel Co., Bethlehem, Pa., steel, \$12,615; The Safe Tread Co., Inc., New York, safety treads, \$15,630; The Steel Products Engineering Co., Springfield, Ohio, fluid segregators, \$15,000; Lundquist Tool & Mfg. Co., Worcester, Mass., telescope mounts, \$105,710; Fort Pitt Bedding Co., Pittsburgh, metallic belt links, \$419,200; Hart Mfg. Co., Louisville, army ranges, \$20,766; The William Miller Range & Furnace Co., Cincinnati, army ranges, \$12,695; The F. A. Klaine Co., Cincinnati, army ranges, \$15,186.

Non-ferrous Metals and Alloys

National Lead Co., Baltimore, wire solder, \$24,037; Federated Metals Di-



Business Humanizer

GEORGE M. VERITY, above, chairman of American Rolling Mill Co., was described as America's outstanding "Humanizer of Business," by B. C. Forbes, magazine publisher, during a recent celebration at Middletown, Ohio.

Twenty thousand of Mr. Verity's employees and fellow townsmen participated in the celebration which included a twilight parade of 3500 marchers on the Armco athletic field. In the parade were Legionnaires, national guardsmen, armored cavalry units, newly-naturalized citizens and many civic and fraternal organizations.

Mr. Forbes, who heads a committee of educational, religious and industrial relations leaders, declared that the Armco chairman "has shown an example to all other employers throughout the country as to how the work folks should be treated. Whenever I see and talk with Mr. Verity, he is always talking about what he owes his co-workers in the mills."

vision, American Smelting & Refining Co., San Francisco, copper ingot, \$11,850; Phelps Dodge Copper Products Corp., New York, condenser tubes, \$13,789; The American Brass Co., Waterbury Conn., copper tubing, \$16,128; Guide Lamp Division, General Motors Corp., Detroit, cartridge cases, \$149,362; Aluminum Company of America, Alcoa, Tenn., aluminum alloy, \$20,320;

Aluminum Company of America, New Kensington, Pa., aluminum tubing, \$30,175; Aluminum Goods Mfg. Co., Manitowoc, Wis., aluminum filters, \$10,859.

Machinery

The American Laundry Machinery Co., Cincinnati, ironer presses, \$14,217; Swind Machinery Co., Philadelphia, power shear, \$18,874; Lloyd & Arms, Inc., Philadelphia, honing machine, \$15,464; Peerless Pump Division, Food Machinery Corp., Massillon, Ohio, gasoline pumps, \$23,194; Worthington Pump & Machinery Corp., Harrison, N. J., refrigeration equipment, \$25,753; Davenport Machine & Foundry Co., Davenport, Iowa, recovery equipment, \$14,346; Allis-Chalmers Mfg. Co., Milwaukee, pumping units, \$172,589; The Hydraulic Press Mfg. Co., Mount Gilead, Ohio, hydraulic press, \$17,310; The National Acme Co., Cleveland, automatic machines, \$35,996; Vandyck Churchill Co., Philadelphia, milling machines, \$13,668; W. E. Shipley Machinery Co., Philadelphia, shapers, \$10,639; Swind Machinery Co., Philadelphia, pickling machines, \$12,300; Henry Prentiss & Co., Inc., New York, grinding machine, \$10,435; Norton Co., Worcester, Mass., grinding machines, \$19,279; The Cleveland Tractor Co., Cleveland, tractors, \$13,775; Caterpillar Tractor Co., Peoria, Ill., tractors, \$62,640; Gardner-Denver Co., Quincy, Ill., pumping units, \$13,070; The C. H. Gosiger Machinery Co., Dayton, Ohio, drill presses, \$21,735; International Harvester Co., Chicago, tractor, \$15,481; Gisholt Machine Co., Madison, Wis., lathes, \$14,477; The C. H. Gosiger Machinery Co., Dayton, Ohio, engine lathe, \$15,593; General Machinery Corp., Niles Tool Works Division, Hamilton, Ohio, engine lathe, \$11,239; H. R. Kreuger & Co., Detroit, reaming machine, \$14,623; Iowa Mfg. Co., Cedar Rapids, Iowa, crushing plant, \$20,685; Koerhing Co., Milwaukee, hauling and dumping units, \$17,085; International Harvester Co., Inc., Chicago, tractor, \$55,243; Northwest Engineering Co., Chicago, power shovel, \$15,754; Allis-Chalmers Mfg. Co., Milwaukee, tractor, \$10,401; American Laundry Machinery Co., Cincinnati and Rochester, N. Y., laundry equipment, \$12,275; Cyril Bath & Co., Cleveland, press brakes, \$11,475; The E. A. Kinsey Co., Cincinnati, cranes, \$14,718; Cincinnati Milling Machine and Cincinnati Grinders, Inc., Cincinnati, milling machines, \$62,618; The Toledo Machine and Tool Division of E. W. Bliss Co., Toledo, presses, \$21,651; Cincinnati Milling Machine and Cincinnati Grinders, Inc., Cincinnati, milling machines, \$73,332; International Harvester Co., Chicago, tractors, \$32,873.

As an illustration of versatility...

take this case, for instance:

A large steel company had been unloading sulfuric acid and hydrochloric acid by air pressure. An accident occurred and, as a consequence, it was decided to use centrifugal pumps.

A Duriron Company Engineer was called in consultation. Analysis showed that sulfuric acid is unloaded from barges into storage tanks. From the storage tanks, the acid is loaded into tank cars for distribution to subdivisions located some distance away. Hydrochloric acid is transferred from tank cars to storage and from storage to service tanks.

The recommendations were: *Duriron Self-Priming Pumps* for the unloading and loading operations of sulfuric acid; *Durichlor Self-Priming Pumps* for handling the hydrochloric acid.

This case illustrates the adaptability of the Duriron Company's alloys and equipment to meet specific conditions.

Although you may not have an exactly similar problem, the Duriron Company products—corrosion-resisting alloys and equipment—are versatile enough to meet almost any condition.

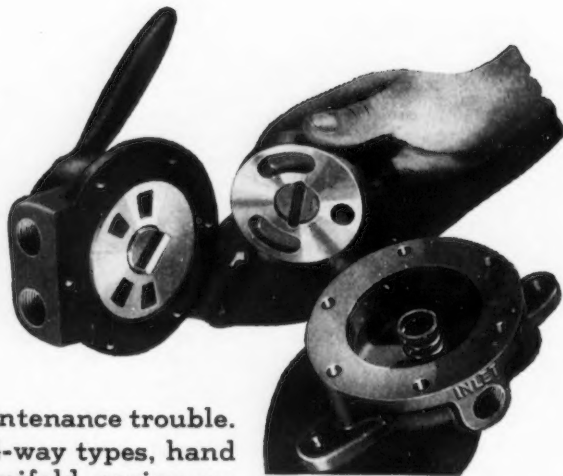
Our engineers will be glad to cooperate with you in the application of these products to your use.

The DURIRON COMPANY, Inc., 438 N. Findlay St., Dayton, Ohio

"PACKLESS"

The bronze disc of the Hannifin Air Control Valve is ground and lapped to form a perfect seal with the seat, which is similarly finished. This simple disc-type design gives positive, accurate control of air operated equipment, and because there is no packing, there is no leakage or packing maintenance trouble.

Made in 3-way and 4-way types, hand and foot operated, manifold, spring return, heavy duty rotary, electric and special models. Write for Valve Bulletin 34-S.



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ENGINEERS • DESIGNERS • MANUFACTURERS • DOUBLE-ACTING PNEUMATIC AND HYDRAULIC CYLINDERS, ALL SIZES

HANNIFIN *"Packless"* **VALVES**
AIR CONTROL

Carbides for Small-Lot Work

(CONCLUDED FROM PAGE 45)

machine from stalling when the tool was in the heaviest cut. A 50 per cent increase in the main drive motor from 20 to 30 hp. did the trick. Result—a 135 per cent increase in production. Machining time per piece was cut from 6.0 min. when using high-speed steel to 2.55 min. Cutting speed, feeds, and other pertinent data about the job are shown in the photograph caption.

Fig. 2 shows the milling of an apron casting. The cut goes to a 5/32-in. depth and the job is run in lots of 25 pieces. There are eight spots to be milled in this operation. One of the problems here obviously is proper support of the work. This piece could be supported without any fixture by simply using clamps on the table. But clamps would not insure complete success with a carbide tipped cutter. And partial success, in other words, an occasional failure of a carbide cutter, can be a very costly proposition. This job, therefore, is supported with a special fixture. In addition, jack-screws are used underneath. The result—100 per cent success with carbide tipped blades. The production increase over high-speed steel is 116 per cent.

Fig. 3 shows the boring of a 4-in. hole in a tailstock top. The cut extends clear through the piece from 12 to 18 in., depending on size. This job is run in lots of about 25 units. Here again is a problem of rigid support, but this time it concerns the support of the cutter.

Plenty of power is made available in the first place by setting up the operation on a specially designed lathe. A standard boring bar is used. But most important, a large, heavy fixture especially designed for the carbide cut, supports the tool. Result—a 400 per cent production increase. And more, a straighter and rounder hole because hard and soft spots in the casting cannot so easily affect size with a carbide cutter. The straighter and rounder hole is important, of course, because it effects no small saving in final assembly time.

In the selection of carbide tools for the great variety of small-lot jobs encountered, it has been found practical and advisable to limit use to two carbide grades—a high tensile (250,000 lb. per sq. in.) carbide for steel, and a lower tensile (175,000 lb. per sq. in.)

carbide for cast iron and other metals. This limits the necessary inventory of stock yet does not materially affect the efficiency of cutting operations.

The feeds and speeds used are not always the feeds and speeds that will give maximum tool life between grinds; but they are usually such as give maximum production per machine per day. The attempt has been made to reach a happy medium in this connection.

Where high-speed steel was used, as much as 1/2 in. of metal was removed in one pass with a cutting speed of 90

German Report Tells of Steel Sales in S. A.

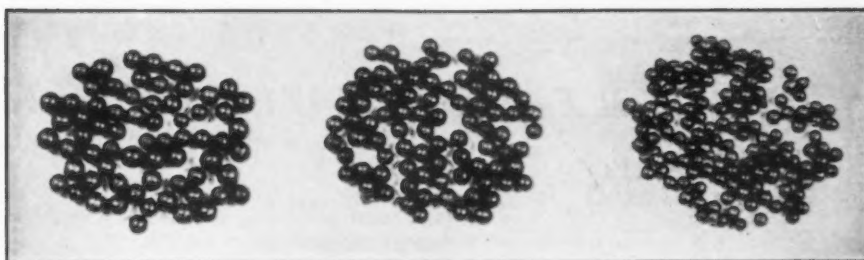
••• The German correspondent of THE IRON AGE reports as follows:

"The German Steel Cartel has resumed export sales in a moderate way to Brazil, Argentina and Uruguay. Nothing can be said about tonnages.

"Machinery is now being exported regularly from Germany to Japan via Siberia, mainly machine tools, which are dismounted for final assembly in Japan. Although transportation costs are high, Japan received during May from Germany via Siberia, machines valued at about 1,300,000 marks."

to 100 surface ft. With carbides this has been reduced to two passes with a cutting speed of 200 to 225 surface feet. In milling, feeds with high-speed steel ran 2 in. per min. With carbides it is up to between 12 and 26 in. per min. Average speed on cast iron is 250 surface ft. per min., on alloy steels 200 ft., and on straight carbon steels 300 to 350 ft.

The cutters are kept in a special bin in the tool crib and issued against a check slip. A man in the tool supply room, who is an expert at his job, devotes full time to grinding the cutters and "trouble shooting" in the various machining departments whenever any difficulties with carbides develop. The problem of chip control in turning steel has been partially solved by the use of chip breakers ground into the tools on equipment especially built for the purpose. Some few of the Monarch operators still prefer a mechanical chip breaker, but this is not generally the case.



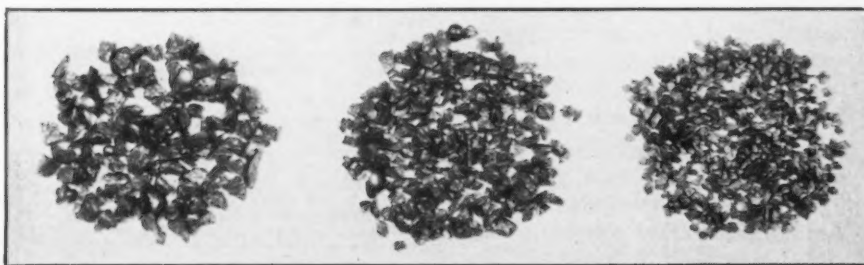
IN the period of one year we have built up a very large business with our Heat-Treated Steel Shot and Heat-Treated Steel Grit. This was accomplished on purely a quality product. Our many hundreds of customers, nationally known Concerns, are using our Shot and Grit, and sav-

We never
compromise
with quality

ing money every day, blasting faster with less wear of abrasive. Our heat treating insures toughness and strength, fast blasting and long wear-ing. Try it in your machine and prove the truthfulness of these statements.
A ton or a carload.
Will match any size.

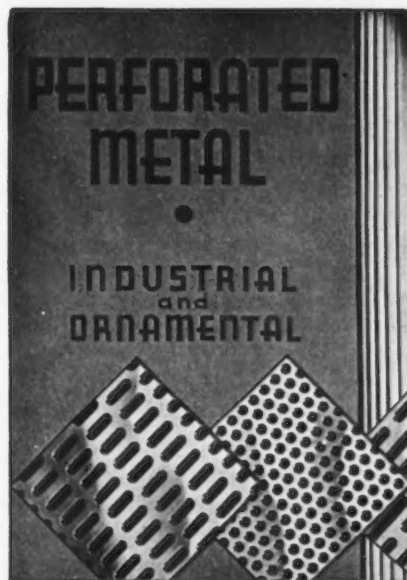
HARRISON ABRASIVE CORPORATION

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May Steel Exports Total 471,481 Gross Tons, Imports 8549 Tons

IMPORTS				EXPORTS			
Five Months Ended May		May		May		Five Months Ended May	
1940	1939	1940	1939	1940	1939	1940	1939
317	3,219	5,132	11,578	23,606	6,737	100,921	20,244
6,848	5,884	12,995	24,191	3,431	2	9,320	36
769	80	1,205	735	759	141	2,770	384
...	25	190	132	...	...	...	...
...	6	609	609	...	...	...	...
33	3,971	1,259	12,266	312,483	384,881	1,162,736	1,390,064
7,967	13,185	21,390	49,511	310,279	391,761	1,274,847	1,410,728
3	41	409	130	129,304	6,927	413,717	40,762
...	...	...	...	3,960	18	8,683	6,356
...	...	...	...	4,799	711	20,131	3,628
...	863	3,848	4,229	16,796	1,881	75,148	7,039
...	904	4,257	4,359	154,859	9,537	517,679	57,785
15	160	80	976	33,838	19,391	192,268	115,064
...	...	...	...	11,808	7,236	74,370	37,939
...	...	...	...	308	518	3,059	1,381
...	...	...	...	62	109	828	370
2	2	6	5	37,581	21,096	177,164	105,536
...	...	...	...	301	141	1,224	402
...	...	...	...	25	14	129	36
82	1,683	1,645	9,943	48,532	11,428	240,384	57,436
5	47	194	276	471	23	6,998	268
...	...	...	...	2,805	2,108	11,099	6,349
...	...	...	...	156	5	496	188
31	168	785	540	...	...	...	...
30	2,092	601	9,074	12,205	5,443	73,697	28,679
...	...	...	...	74	88	407	215
...	...	...	...	45	49	314	384
...	...	...	...	1,009	236	3,765	1,816
107	5,008	687	20,692	15,766	6,891	79,918	31,639
14	5	51	24	7,023	2,707	30,448	13,943
...	...	...	...	30,264	16,500	233,603	74,780
...	...	...	...	1,477	2,020	11,648	8,798
...	389	...	3,364	7,464	3,484	42,458	18,338
91	364	1,873	23,846	14,724	7,504	88,460	29,920
...	...	...	...	1,604	695	9,827	2,886
1	116	768	1,172	5,991	3,537	36,012	20,154
50	143	370	939	1,143	874	4,909	4,891
...	1,829	44	8,375	4,300	4,003	15,143	16,975
61	445	1,256	2,300	10,534	...	51,314	...
12	621	95	4,168	637	1,955	2,648	...
20	17	121	60	1,496	645	6,241	3,276
44	720	354	2,886	19,193	6,312	62,865	39,774
1	65	12	80	...	...	...	...
...	34	3	196	1,344	533	8,328	2,619
566	13,908	8,945	89,361	272,180	125,545	1,470,524	624,505
...	76	419	351	11,774	1,001	28,524	12,259
...	46	65	353	291	307	2,133	1,457
...	...	...	...	732	1,794	12,408	6,666
...	...	...	...	1,318	2,293	2,570	1,492
...	...	...	...	16,616	5,798	6,987	9,479
8,582	28,142	35,366	144,407	783,964	532,641	3,315,672	2,123,371

¹ In imports the tonnage shown is the alloy content: the manganese, chromium and silicon content, as the case may be. ² Imports include skelp and saw plate. ³ Import figure includes iron slabs. ⁴ Imports include sashes and frames only.

*No separate figures.

Shippers See 28% Gain In Steel Car Loadings

Washington

••• Iron and steel shipments in the third quarter of 1940 are estimated by the 13 Shippers Advisory Boards of the Association of American Railroads at 456,043 carloads, an increase of 28.8 per cent over the 354,046 carloads shipped in the 1939 third quarter. Total carloadings of the 29 principal commodities for the third

quarter of the current year are estimated at 6,173,517 cars, an increase of about 9 per cent over the 5,663,517 actual car loadings in the corresponding period of last year. The six commodities for which 1940 third quarter reductions under 1939 third quarter loadings are estimated are grains and vegetables.

Among commodities in addition to iron and steel estimated to show increased shipments in the third quarter of 1940 are the following, in carloads:

	Estimated 1940	Actual 1939	Increase Per Cent
Coal and coke.....	1,801,744	1,665,548	8.2
Ore and concentrates.....	742,837	606,280	22.5
Machinery and boilers.....	28,925	24,927	16.0
Agriculture implements and vehicles.....	...	...	...
Automobiles, trucks and parts.....	88,219	70,852	24.5

Westinghouse to Light Washington Airport

••• The Cleveland plant of Westinghouse Electric & Mfg. Co. will supply lighting equipment to be installed at the new Washington airport. The order exceeds \$110,000.

Ship Reconditioning Contracts Awarded

••• The Maritime Commission has awarded the Bethlehem Steel Co., Baltimore, a contract for reconditioning the steamship Siletz at a cost of \$124,800. The Todd-Galveston Co., Galveston, Tex., was awarded a contract for reconditioning the steamship West Sego via at a cost of \$141,965.

U. S. May Smelt Bolivian Tin Ore

Washington

••• **Announcement** by Edward R. Stettinius, Jr., in charge of the Materials Division of the National Defense Advisory Commission, that conferences have been held with four principal smelting companies in the United States toward the erection of a tin smelting capacity in the United States, means that under the emergency of national defense needs this country is preparing to bring to an end its dependence on foreign smelters for its pig tin. The project, Mr. Stettinius said, was undertaken in the face of the possibility that the tin supply from the Straits Settlement might be cut off.

Fitting in with conferences that smelting representatives have held with Federal Loan Administrator Jesse Jones, the State Department, Advisory Commission and other agencies, the statement by Mr. Stettinius indicated clearly that the plan is to turn to Bolivian tin ore, which, to be "sweetened" with higher-grade ores, will be smelted in the domestic plant rather than being taken to England for that purpose. The United States consumes normally approximately 45 per cent of the world's tin production, or 75,000 tons annually.

"Tin ores are now produced in Bolivia and shipped to England," Mr. Stettinius pointed out. "This could be eliminated by smelting in this country."

Participation by Mr. Jones in the conferences regarding the building of a tin smelter in the United States reflects the fact that the Government will give financial aid to the smelters.

Actual construction of tin smelting capacity in the United States will begin at an early date. Expediting of the work has been urged as officials have pointed out that 81 per cent of the tin consumed in the United States in the ordinary course of trade comes from Asia, British Malaya and the Dutch East Indies, an area that is threatened in a dispute between Western nations and Japan.

Continental Can to Build \$200,000 Addition

Chicago

••• **The Continental Can Co.** has awarded a contract to the Austin Co., Cleveland, to build a \$200,000 addition to its South Ashland Avenue plant here. The 140 by 200 ft. structure will be four floors in height and will constitute increased space for carrying on regular manufacturing activities. It is not believed that a great deal of new equipment will be necessary as present facilities will be rearranged to take advantage of the increased space. Completion is expected in about six months.

Nash Will Produce New Model in 1941

Detroit

••• **Completion** of a \$6,500,000 expansion and modernization program within a short time will put the automobile division of Nash-Kelvinator Corp. in position to bid for the mass markets with a lower-priced six-cylinder model in 1941. Plant modernization and enlargement of facilities have been carried out in the last year at Kenosha and Milwaukee, Wis. The new model will be an addition to the company's other car lines and will be announced publicly early this fall.

Worker Dismissed, 800 Others Go On Strike in Illinois

Belvidere, Ill.

••• **Demanding** reinstatement of a discharged employee to his job, more than 800 employees affiliated with AFL craft unions at the National Sewing Machine Co. plant here, went on strike late last week. Pickets have been posted at all entrances to the plant but there has been no disorder. According to union officials, the strike was called when they learned of the removal of tools and dies from the grinding room by the company. The company has been enjoying an active period and has received considerable export business.

Weirton to Appeal Labor Board Ruling

••• **Weirton Steel Co.** plans to take to the courts its appeal against the National Labor Relations Board decision ordering the company to disestablish plant unions and award back pay to 17 employees. A statement by T. E. Milsop, Weirton president, said, in part:

"Almost three years have elapsed since the hearing began and it has taken the board nearly a year and a half to write its proposed decision, after a hearing of 18 months. The fact that the board attempts to award back pay to 17 men for the three years which the board wasted in hearing and deciding the case confirms the proof which has been amassed by the Smith Committee, of the board's notorious disregard for the rights of employers.

"It is significant that two of the 17 men are now being prosecuted in West Virginia in connection with their signatures to Communist petitions. Throughout the hearing the board consistently prevented the company from presenting any proof of Communistic activities on the part of the claimants and CIO organizers.

"The decision dismisses the CIO's demand for certification and recognition, because the CIO was unable to show any substantial membership among the company's employees. This conclusion provides a startling contrast to the original extravagant claims of the CIO, which brought about the costly 18 months' hearing."

Scrap Shortage Cuts Japan's Steel Output

Washington

••• **Curtailment** of Japanese iron and steel production because of a scarcity of iron and steel scrap is reported to the Commerce Department by the American commercial attache in Tokyo. The report reflected stories published in Tokyo that the quality of scrap available is considerably below the standard of that formerly prevailing, and that because of scrap quotas steel producers are able to operate at only 50 per cent of capacity.

Roosevelt Lists Progress Under National Defense Commission

Washington

• • • Clearance of \$1,661,891,494 worth of army and navy contracts since June 6, removing bottlenecks in the machine tool industry, and recommendations for the acquisition of substantial numbers of special rolling stock for special defense transportation were reported to the White House on Tuesday by the National Defense Advisory Commission.

Mr. Roosevelt, in announcing details of progress reports submitted by individual members of the defense commission at his regular bi-weekly press conference, revealed these developments:

1. Contracts cleared by the commission, totaling \$1,661,891,494, aggregated \$1,390,575,404 for the Navy and \$277,316,089 for the Army, and covered orders for aircraft, tanks, battleships, ammunition, anti-tank guns, searchlights, machine guns among other products.

2. Removal of machine tool bottlenecks is expected as a result of the statutory embargo authority

recently invoked which, according to Commission Member William S. Knudsen, has "contributed substantially to the retention of vital machine tool units which otherwise would have been exported."

3. A meeting of the machine tool defense committee on Wednesday was scheduled to discuss a cooperative plan under which a definite percentage of machine tool manufacturing facilities will be reserved for defense needs.

4. The commission transportation division, headed by Ralph Budd, has placed emphasis on securing a suitable car supply to meet emergency demands on rail transportation and reported that concrete recommendations have been drawn for acquisition of very substantial numbers of special rolling stock for handling troops and their equipment. Conferences have been held with representatives of railway car shops to discuss costs and types of cars. Also reported under way were studies involving the inland waterways and pipe line problems.

Structural Steel Awards Advance

Fabricated structural steel awards jumped to 49,125 tons from 14,500 tons last week. Defense projects are increasing. Outstanding lettings are 11,000 tons at Far Rockaway, N. Y., for the Long Island Railroad; 7545 tons for the Southern California Edison Co., Los Angeles, for transmission towers for its Boulder-Chino lines; 5000 tons at San Francisco for appraiser's stores and immigration station; 4000 tons at Burbank for the Lockheed-Vega airplane plant extension; 2000 tons for land hangars for the naval air station at Alameda, Cal.; 1400 tons for the Navy and Munitions Building, Washington; 1200 tons for the Vultee Aircraft Co. at Downey, Cal., and 1000 tons for the Bath Iron Works, Bath, Me.

New structural steel projects are also higher at 23,600 tons. The largest inquiries reported are 4700 tons at Venice, Ill., for a power plant for the Union Electric Co. of Illinois; 2700 tons at Brooklyn for the Kingsborough housing project and 2200 tons in New York and Brooklyn, for curbing.

Nearly 13,000 tons of structural steel was awarded on the Pacific Coast this week.

June Shipments of U.S. Steel Reach New Peak for 1940

Month	1936		1937		1938		1939		1940	
	Shipments	Per Cent of Capacity*	Shipments	Per Cent of Capacity*	Shipments	Per Cent of Capacity*	Shipments	Per Cent of Capacity*	Shipments	Per Cent of Capacity*
January	795,214	44.8	1,268,403	75.4	570,264	33.7	870,866	51.8	1,145,592	69.8
February	747,375	45.3	1,252,845	82.5	522,395	35.5	747,427	49.3	1,009,256	65.8
March	863,946	50.5	1,563,113	92.7	627,047	37.2	845,108	50.4	931,905	56.8
April	1,080,667	63.2	1,485,231	91.0	550,551	33.7	771,752	47.5	907,904	57.1
May	1,087,395	63.4	1,443,477	85.5	509,811	30.2	795,689	47.4	1,084,057	66.0
June	978,030	57.1	1,405,078	85.8	524,994	32.1	607,562	49.7	1,209,684	76.1
July	1,050,085	61.3	1,315,353	77.9	484,611	28.8	745,364	44.5		
August	1,019,882	59.6	1,225,907	72.6	615,521	36.3	885,636	52.7		
September	1,060,708	62.0	1,161,113	71.1	635,645	37.5	1,086,683	66.9		
October	1,108,973	62.6	875,972	52.0	730,312	43.1	1,345,855	79.9		
November	974,292	59.2	648,727	39.7	749,328	45.6	1,406,205	86.1		
December	1,178,598	68.8	539,553	32.1	765,868	45.2	1,443,969	85.8		
Yearly adjustment..	(—) 40,163	...	(—) 87,106	...	(+) 29,159	...	(—) 44,865	...		
Total for year...	11,905,002	58.2	14,097,666	70.4	7,315,506	36.7	11,707,251	59.4		

* Rolled and finished steel capacity.

Finished steel shipments by subsidiary companies of U. S. Steel Corp. in June were 1,209,684 net tons, a new high for the current year. May shipments were 907,904 tons and June, 1939, were 607,562 tons.

June shipments were at a rate equal to 76.1 per cent of the corporation's rolled and finished steel capacity, as compared with 66 per cent in the preceding month and 49.7 per cent in June, a year ago.

Deliveries for the current year to date total 6,288,398 net tons, as against 4,838,401 tons in the comparable period in 1939. Shipments for the first six months of 1940 were equal to 65 per cent of capacity.

Chicago Metal Hose Will Enlarge Plant

Chicago

• • • A 16,000 sq. ft. addition to its Maywood, Ill., plant is being constructed by the Chicago Metal Hose Co. in order to accommodate increasing demand from its regular industrial customers for flexible metal tubing and from the aircraft industry for newly developed tubing of stainless steel and other metals. According to company officials, light weight stainless steel flexible tubing is assuming an important part in the national defense program since many of the large aircraft manufacturers are making use of this tubing for various applications in the engines and fuselage.

The new structure, near the present plant, should be completed by October. Little new equipment will be necessary, the company making most of its machinery.

One of the latest items made for use in the aircraft industry is a new tubing consisting of a metal core covered with layers of cellulose sheet, vulcanized rubber and finally with a metallic braid.

\$3,779,628 Training Plane Order Goes to Boeing

• • • The Stearman Aircraft Division of Boeing Airplane Co., Wichita, Kan., has received notification of the award of a contract by the Navy Department for primary training planes and spare parts amounting to \$3,779,628. The company is now producing \$2,843,405 worth of primary trainers for the U. S. Army Air Corps. The army contract and the new navy contract have each in turn ranked as the largest peace-time orders for trainers that have been placed by the United States government.

Williams Aircraft Corp. To Build Toledo Plant

Toledo

• • • Colonel Roger Williams, trans-Atlantic flyer, has announced formation of the Williams Aircraft Corp. The company will build a plant here immediately and has contracts to make parts for airplane companies working on army and navy orders.

Reprints Available of Willkie Editorial

• • • Because of the heavy demand for reprints, the Wendell L. Willkie editorial on page 27 of the July 11 issue of THE IRON AGE (Help Wanted! — Well, Mister, Here's Your Man!), has been held in type.

Reprints will be supplied at cost. Please send orders or requests for quotations to Reader Service Dept., THE IRON AGE, 100 East 42nd Street, New York.

\$3,302,139 Gun Carriage Order to Aetna-Standard

Youngstown

• • • Aetna-Standard Engineering Co. has been awarded a \$3,302,139 contract by the War Department for construction of gun carriages, according to an announcement at Washington. Ernest E. Swartswelter, president and chairman of Aetna-Standard, said the order would be filled in the company's large Ellwood City, Pa., plant. About 500 additional men will be employed to fill the order.

2¢ Pay Increase Averts CIO-Aluminum Strike

Pittsburgh

• • • Involving approximately 14,000 workers, an agreement between the Aluminum Co. of America and the CIO Aluminum Workers of America union was reached last week whereby a pay increase of 2c. an hour was granted to all hourly employees except beginners and those workers whose pay has been increased that amount or more since Oct. 1, 1939. The union had asked 10c. an hour and had threatened widespread strikes.

Army Places Record Order for 629 Tanks

Washington

• • • Assistant Secretary of War Johnson on Monday announced award of a contract for light tanks to the American Car & Foundry Co. at approximately \$11,500,000. It is reported that the contract covers 627 12-ton tanks, the largest award

ever made in peacetime in this country.

The award was from the Rock Island Arsenal, the unit cost being \$17,500 compared to \$25,000 in previous awards. The tanks will be made at the Berwick, Pa., plant.

Marking an all-time record, the Navy Department's Bureau of Yards and Docks awarded a total of 705 contracts at \$286,930,883 during the fiscal year ended June 30, 1940. The department announced that 640 of the contracts at \$73,322,259 were construction contracts made on a competitive basis, while 25 contracts at \$211,729,363 were construction awards made on a negotiated basis. The remaining 40 contracts were service contracts and involved \$1,879,261.

Merger Proposed for National Cylinder Gas Co.

Chicago

• • • A merger of the National Cylinder Gas Co. and Compressed Industrial Gases, Inc., has been proposed by directors of both companies subject to approval by stockholders at a meeting Aug. 27. The joining of these two companies, third and fourth largest in their field, is expected to permit economies of production and distribution, and greater research and service facilities. The surviving company will be known as the National Cylinder Gas Co. Both companies produce industrial gases for welding, flame cutting and flame hardening. Cutting and hardening equipment for the use of these gases is also manufactured. Charles J. Haines is president of National Cylinder and Horace B. Pearson is president of Compressed Industrial Gases.

Farm Equipment Union Votes to Join UAW

Chicago

• • • In the interests of speedier organization of non-union workers, the Farm Equipment Workers Organizing Committee went on record last week as favoring merger with the United Automobile Workers of America. The auto workers claim about 400,000 members while the farm equipment union claims around 24,000 members, mainly in farm equipment plants in this district. Both unions are affiliates of the CIO.

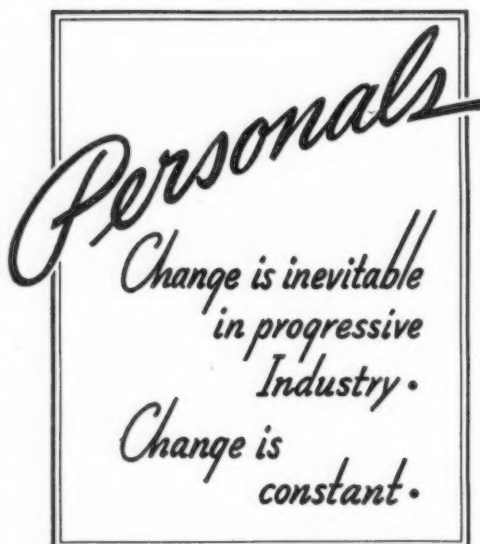
• **John M. Price** has been elected president of the Ferro Machine & Foundry Co., Cleveland, succeeding the late James F. Leitch. For the past five years Mr. Price has been vice-president of the company, which is an affiliate of Oglebay, Norton & Co. **Henry B. Myers**, for six years Ferro factory manager, has been elected vice-president of the company.

Mr. Price has had a diversified career. Born Sept. 13, 1889, at Ironton, Ohio, he obtained his A.B. degree from Western Reserve University, Cleveland, in 1911, and a mining degree at Case School of Applied Science in 1913. He then started with the Montreal Mining Co., of Montreal, Wis., as chief engineer, and in 1916 became assistant superintendent of the Ottawa mine of that corporation. From 1920 to 1925 he served as superintendent of the Montreal company. From 1925 to 1929 he was superintendent of the Cast Steel Mining Co. of Ramsay, Mich. From 1929 to 1932 Mr. Price served as foreign representative for Oglebay, Norton & Co. in Soviet Russia in charge of 20 American engineers there. In the World War he served as a second lieutenant in the Engineering Section of the Air Service.

Mr. Myers became associated with the Ferro Machine & Foundry Co. in 1911 as an inspector. Four years later he was made su-



JOHN M. PRICE, president of the Ferro Machine & Foundry Co.



perintendent of the machine shop and since 1934 has been factory manager.

• **John R. Haysak** has been elected vice-president in charge of factory management of Ferry Cap & Set Screw Co., Cleveland. Mr. Haysak, who has been with the company for 21 years, was formerly chief inspector and later factory manager. He assumes his new duties at once.

• **John H. Alsos** has been named chief inspector of Olds Motor Works, succeeding **K. C. Plasterer**, who in the future will handle special assignments, reporting to **C. J. McCuen**, general manager. Mr. Alsos has been active in engineering and production for 21 years. In 1925 he became a member of the Olds engineering department; becoming chief draftsman in 1926, assistant production engineer in 1930 and production engineer in 1933.

• **J. Carlton Ward, Jr.**, until recently vice-president of the United Aircraft Corp. and general manager of the Pratt & Whitney division, has been made president of the Fairchild Engine & Airplane Corp. to succeed **Sherman Fairchild**, who becomes president of the board.

• **H. A. Taylor**, for 14 years New York district manager for the Concrete Steel Co., has joined the New York district office of Truscon Steel Co., Youngstown. He will be in charge of the sale of reinforcing bars, steel joists and kindred products.

• **Kirke W. Connor**, president and general manager of Micromatic Hone Corp., Detroit, has been named assistant chairman in the production activity of the Detroit section of the Society of Automotive Engineers for the 1940-41 season.

• **Sumner Pond**, for the past two years with the factory sales department of Universal Gear Corp., Indianapolis, Ind., has been made manager of the Detroit office, with headquarters at 2842 West Grand Boulevard.

• **M. B. Sackheim**, vice-president, has been made general manager of the Brown Fence & Wire Co., Cleveland. **C. R. Underhill**, president since 1937, has resigned.

• **Mowry E. Goetz** has been appointed Chicago district manager of operations of Republic Steel Corp., Cleveland, with **F. R. Ward** as assistant district manager. Mr. Goetz succeeds **J. L. Hyland**, who was recently made district manager of Republic's Cleveland operations. Before joining the Republic company early this year, Mr. Goetz was associated with the Northwest Steel & Wire Co., Sterling, Ill., as general superintendent. Prior to that he was identified with the Jones & Laughlin Steel Corp. in the open hearth and rolling mill departments. In addi-



MOWRY E. GOETZ, Chicago district manager of Republic Steel Corp.

tion to South Chicago and Grand Crossing works in Chicago, he also has charge of the Sylvan works in Moline, Ill. Mr. Goetz was graduated from Penn State College in 1917 as a metallurgical engineer.

• **E. Gordon Fox**, vice-president of the Freyn Engineering Co., Chicago, has assumed office as president of the Western Society of Engineers, Chicago.

• **Charles F. Kettering**, vice-president and director of General Motors Corp., has been appointed honorary chairman of the 100th national meeting of the American Chemical Society, to be held in Detroit, Sept. 9 to 13.

• **Henry S. Hall**, until recently open-hearth fuel engineer at the Middleton, Ohio, plant of the American Rolling Mill Co., has joined Lukens Steel Co., Coatesville, Pa., as fuel engineer. He was graduated from the University of Pittsburgh in 1924 with a B.S. in mechanical engineering and for the following two years was Pittsburgh district service engineer for Republic Flow Meters Co. He joined Youngstown Sheet & Tube Co. in 1926 as test engineer and was assistant superintendent of the open hearth division of American Rolling Mill Co. in the Butler, Pa., plant.

• **Fred L. Plummer**, chief design engineer on the Main Avenue Bridge in Cleveland, has been made chief research engineer for Hammond Iron Works, New York and Warren, Ohio. He will aid Hammond engineers in developing new types of low-pressure and special shape storage vessels required by the petroleum and other industries. He has taught structural engineering at Case School of Applied Science for 15 years.

• **John S. Roney**, formerly sales engineer for Foote Brothers Gear & Machine Corp., Chicago, has been made factory representative for eastern Michigan with headquarters at 14425 Mark Twain Avenue, Detroit, by McKenna Metals Co., Latrobe, Pa.

• **K. T. Davis**, for a number of years vice-president and general manager of Tate-Jones & Co., Inc., Leetsdale, Pa., has joined the sales engineering staff of the Drever Co., Philadelphia.

• **William W. Barnes**, who has been Philadelphia manager of Air Reduction Co., New York, since 1922, has retired. He first became associated with the oxyacetylene



WILLIAM W. BARNES, retired Philadelphia manager of Air Reduction Co.

industry in 1910 when he joined the Davis-Bournonville Co. as Philadelphia sales manager, remaining in that post until the merger of that company with Air Reduction in 1922.

• **Gerald P. Trachta**, superintendent of motive power, the Rock Island Lines, has been made assistant chief operating officer-mechanical. **A. R. Ruiter**, formerly assistant to chief operating officer, has been appointed superintendent of motive power with headquarters in Chicago, for the first mechanical district of the road.

• **John F. Lebor** has been appointed assistant to the executive vice-president of the York Ice Machinery Corp., York, Pa.

• **Don L. Orton** has been made factory representative of the Louis Allis Co., Milwaukee, in the Calumet area, with office at 8600 Pine Avenue, Gary, Ind.

• **August H. Tuechter**, president of the Cincinnati Bickford Tool Co., completed 55 years of service with this company on July 13.

Typical of the American success story, Mr. Tuechter joined the machine tool industry as a youth, in his mid-teens, in a humble capacity. Faced with the problem of supporting his widowed mother and five younger members of the family, he entered the employ of the H. Bickford Co. in July, 1885, as a secretary and bookkeeper. The company at that time was a very small concern, employing only a dozen or more men in the manufacture of radial drills. Subsequently, the H. Bickford Co. joined with the Cincinnati Machine Co. to form the Cincinnati Bickford Machine Tool Co., and rounded out its line of tools to include upright and radial drills. Having worked hard and diligently, Mr. Tuechter was able to make an investment in the new concern, and shortly thereafter became president, which office he has held to the present time.

During the 55 years of his service to the Bickford company, Mr. Tuechter has seen the machine tool industry of Cincinnati grow from infancy to a full-sized industry which has made Cincinnati "the machine tool center of America." He has been active in the National Machine Tool Builders' Association, having been a president and having served on its board of directors a number of times. He also has been active in the National Metal Trades Association.

Music has been his hobby throughout the years and he has earned a reputation as an organist and director of choirs in Cincinnati. In keeping with this hobby, he has been a member of the Cincinnati May Festival Association, the Orpheus Club and a patron of the Cincinnati Zoo opera for many years. In civic affairs he has been one of the outstanding leaders in his community and is a member of the Rotary Club, the Cincinnati Club, and active in the fostering of the work of the General Protestant Orphans Home of Cincinnati. In addition, he is director of several banks and his counsel has been frequently sought by business men in many fields.

Among his employees, Mr. Tuechter is not regarded as "the boss," but as a friend to whom they may go at any time. In fact, it is a rule of his company that any employee may come to his office at any time for the discussion of any problem that he may

have and is always assured of a kindly and sympathetic discussion. Mr. Tuechter has never married, but lived with his mother until her death a few years ago.

- **W. S. McKee** has been appointed assistant treasurer, Jones & Laughlin Steel Corp., Pittsburgh. Mr. McKee has been with Jones & Laughlin as credit manager for several years.

- **B. S. Woodman**, heretofore special representative and Philadelphia branch manager for Wagner Electric Corp., has been appointed special representative for the Roller-Smith Co., Bethlehem, Pa.

- **Carl A. Zapffe** and **Charles L. Faust**, metallurgist and chemical engineer, respectively, Battelle Memorial Institute, were awarded the 1940 Proctor Memorial award of the American Electroplaters' Society at the recent annual meeting for their paper on "Metallurgical Aspects of Hydrogen in Electroplating."

- **George B. Troxell**, who has been identified with Bethlehem Steel Co., Bethlehem, Pa., since 1916 in the operating, metallurgical and sales divisions, recently returned to this country from a three months' stay in France and England.

- **C. S. Thayer**, who has been superintendent of the Niagara Falls, N. Y., plant of the Aluminum Co. of America for 17 years, has been made general plant superintendent of the company's new plant at Vancouver, Wash. **David H. Beeten**, heretofore operating assistant at Niagara Falls, has been assigned to a similar post at the Vancouver plant, and **John B. Holmes**, assistant superintendent at Niagara Falls, has been promoted to the post of plant superintendent there.

- **William A. Maxwell**, who has just received his degree in chemical engineering at the South Dakota School of Mines, has joined the research staff of the Foote Mineral Co., Philadelphia.

- **J. D. East**, of the statistical staff of the United States Steel Corp., has been added to the staff of **Edward R. Stettinius, Jr.**, Washington, as statistician.

Obituary

- **Frederick J. Elliott**, district manager for Ohio and Pennsylvania for the Rustless Iron & Steel Corp., died July 10 at Cleveland Clinic Hospital. Mr. Elliott was transferred to Cleveland from Detroit three years ago. He was born in County Cork, Ireland, and first came to this country to attend Harvard University, of which he was a graduate. In the World War he was a British Army captain. Mr. Elliott had made his permanent home in the United States the last 15 years. He was 46 years old.



CHARLES C. WARNE, whose death on July 6 was announced in these columns last week.

- **J. D. Leary**, vice-president of the Cincinnati Steel Castings Co., Cincinnati, died at his home on July 11.

- **Thomas I. Cochran**, district sales manager of the Saginaw Sheet Metal Parts Corp., in Detroit, died July 6 in Henry Ford Hospital after a short illness. Mr. Cochran also was manufacturer's representative in Detroit for Charles E. Crofoot Gear Co., the Fostoria Pressed Steel Corp. and the Radiator Specialty Corp.

- **Robert P. Durham**, president of the McDonald Engineering Co., Chicago, and prominent as a grain elevator engineer, died here last week. Mr. Durham joined the McDonald Engineering Co. in 1916, becoming president six years later.

- **Col. Samuel Ellsworth Winslow**, skate manufacturer, died at the Worcester, Mass., city hospital on July 11. He was born in Worcester, April 11, 1862, and was graduated from Harvard as president of the class of 1885. In 1894 he succeeded his father as president of the Samuel Winslow Mfg. Co.

- **Edward P. Van Stone**, president of the General Alloys Co., South Boston, iron founders, until his retirement about a year ago, died on July 8 at his home in Reading, Mass. He was 54 years old.

- **Albert R. Braden**, superintendent of the United Shoe Machinery Corp., Beverly, Mass., drop forging department, died in that city on July 11, in his 64th year.

- **James F. Leitch**, president Ferro Machine & Foundry Co., Cleveland, since 1920, died June 30 at his home in Cleveland Heights. He had been ill about three months. Born in Detroit, he received his early education in Marine City, Mich. He went to Cleveland in 1895 with Oglebay, Norton & Co. In 1907 he was appointed secretary-treasurer of the Ferro Machine & Foundry Co., a subsidiary of Oglebay, Norton & Co.

- **Erling O. Oyen**, 54, well known mechanical engineer at the Youngstown Sheet & Tube Co. for 17 years, died June 28. Before going to Youngstown he was automotive engineer at Butler Standard Car Works in Detroit.

- **R. W. Rhoades**, until 1938 president and chairman of the board of the R. W. Rhoades Metaline Co., Inc., Long Island City, N. Y., died at his home in Mount Vernon, N. Y., on June 29, aged 84 years. He had been identified with the company and its predecessor companies for 62 years. Mr. Rhoades was elected president on the incorporation of the company in 1926. Although he resigned 20 years ago, he had continued as president and chairman until 1938.

Finished and Semi-Finished Steel Produced in May

••• Production of finished and semi-finished steel in May was equal to 72.2 per cent of the industry's capacity, according to the monthly report of the American Iron and Steel Institute on steel produced for sale. The total

amount of finished and semi-finished steel produced for sale in the month was 3,576,860 net tons, of which 289,653 tons was shipped to members of the industry for further conversion. Exports in the month totaled 476,761 tons.

The product in which highest operations were attained is cold reduced tin plate, which was turned out at a rate of 84.6 per cent of capacity. Sheet piling came next with an operation of 80.3 per cent. Production of sheets 65.9 per cent.

35-200-6-40

200-540			AMERICAN IRON AND STEEL INSTITUTE										May - 1940			
Capacity and Production for Sale of Iron and Steel Products																
PERIOD																
PRODUCTION FOR SALE—NET TONS																
			Number of companies	Items	Annual Capacity Net tons	Current Month				To Date (5 Months 1940)						
						Total	Per cent of capacity	Shipments		Total	Per Cent of capacity	Shipments				
								Export	To members of the industry for conversion into further finished products			Export	To members of the industry for conversion into further finished products			
STEEL PRODUCTS	Ingots, blooms, billets, slabs, sheet bars, etc.	32	1	xxxxxx	465,235	xxx	132,927	171,282	1,827,367	xxx	509,317	645,022				
	Heavy structural shapes	8	2	5,205,500	209,604	47.5	19,424	xxxxxxx	920,324	42.6	77,079	xxxxxxx				
	Steel piling	4	3	328,000	22,518	80.3	3,196	xxxxxxx	62,696	46.0	6,985	xxxxxxx				
	Plates—Sheared and Universal	19	4	5,855,450	281,806	56.8	50,584	583	1,406,389	57.8	178,518	12,746				
	Skelp	7	5	xxxxxx	57,531	xxx	5,251	30,048	209,079	xxx	26,417	85,383				
	Rails—Standard (over 60 lbs.)	4	6	3,647,600	136,705	44.2	15,394	xxxxxxx	786,342	51.9	41,490	xxxxxxx				
	Light (60 lbs. and under)	6	7	306,800	6,718	25.8	4,516	xxxxxxx	40,568	31.8	13,601	xxxxxxx				
	All other (Incl. girder, guard, etc.)	2	8	118,000	3,012	30.1	36	xxxxxxx	16,102	32.8	2,306	xxxxxxx				
	Splice bar and tie plates	15	9	1,300,200	50,483	45.8	1,006	xxxxxxx	272,909	50.5	4,324	xxxxxxx				
	Bars—Merchant	35	10	xxxxxx	289,299	xxx	36,532	23,759	1,593,877	xxx	153,850	130,272				
	Concrete reinforcing—New billet	15	11	xxxxxx	112,983	xxx	21,938	xxxxxxx	434,584	xxx	122,070	xxxxxxx				
	Rerolling	18	12	xxxxxx	15,436	xxx	240	xxxxxxx	54,168	xxx	3,866	xxxxxxx				
	Cold finished—Carbon	18	13	xxxxxx	46,058	xxx	1,630	xxxxxxx	255,488	xxx	5,542	xxxxxxx				
	Alloy—Hot rolled	15	14	xxxxxx	66,659	xxx	3,419	4,974	340,710	xxx	19,662	23,955				
	Cold finished	14	15	xxxxxx	6,413	xxx	120	xxxxxxx	36,749	xxx	1,099	xxxxxxx				
	Hoops and baling bands	5	16	xxxxxx	7,410	xxx	1,124	xxxxxxx	36,410	xxx	2,965	xxxxxxx				
	TOTAL BARS	53	17	12,372,465	544,258	51.9	65,003	28,733	2,751,986	53.5	309,054	154,227				
	Tool steel bars (rolled and forged)	15	18	110,220	5,142	55.1	984	xxxxxxx	27,018	59.0	1,927	xxxxxxx				
	Pipe and tube—B. W.	13	19	1,737,860	81,459	55.3	6,138	xxxxxxx	343,200	47.5	33,312	xxxxxxx				
	L. W.	10	20	1,246,340	27,968	26.5	1,942	xxxxxxx	125,323	24.2	15,344	xxxxxxx				
	Electric weld	5	21	731,320	20,087	32.4	1,147	xxxxxxx	92,551	30.5	10,242	xxxxxxx				
	Seamless	15	22	3,159,840	141,539	52.9	13,959	xxxxxxx	703,630	53.6	73,718	xxxxxxx				
	Conduit	6	23	151,145	5,094	39.8	194	xxxxxxx	26,006	41.4	756	xxxxxxx				
	Mechanical Tubing	13	24	554,825	18,955	40.3	1,237	xxxxxxx	108,941	47.3	5,434	xxxxxxx				
	Wire rods	19	25	xxxxxx	75,050	xxx	24,515	12,071	391,581	xxx	99,330	62,575				
	Wire—Drawn	37	26	2,255,210	107,662	56.3	12,419	653	543,949	58.1	68,935	6,417				
	Nails and staples	19	27	1,091,690	51,242	55.4	6,705	xxxxxxx	225,867	49.8	26,820	xxxxxxx				
	Barbed and twisted	16	28	438,270	20,505	55.2	3,981	xxxxxxx	78,638	43.2	13,221	xxxxxxx				
	Woven wire fence	15	29	772,790	24,178	36.9	127	xxxxxxx	103,919	32.4	978	xxxxxxx				
	Bale ties	11	30	119,050	6,413	63.6	-	xxxxxxx	22,813	46.1	113	xxxxxxx				
	All other wire products	6	31	27,030	1,668	72.8	-	xxxxxxx	5,169	46.0	-	xxxxxxx				
	Fence posts	13	32	147,485	6,221	49.8	114	xxxxxxx	22,198	36.2	364	xxxxxxx				
	Black plate	12	33	653,295	35,118	63.4	2,266	9,565	156,832	57.8	7,868	50,072				
	Tin plate—Hot rolled	9	34	1,201,960	38,071	37.4	3,653	xxxxxxx	219,699	44.0	58,929	xxxxxxx				
	Cold reduced	10	35	2,930,860	210,007	84.6	33,950	xxxxxxx	961,867	79.0	191,068	xxxxxxx				
	Sheets—Hot rolled	26	36	xxxxxx	410,190	xxx	40,011	25,064	2,061,617	xxx	207,817	75,866				
	Galvanized	16	37	xxxxxx	103,870	xxx	11,215	xxxxxxx	500,255	xxx	73,058	xxxxxxx				
	Cold rolled	18	38	xxxxxx	183,046	xxx	5,315	xxxxxxx	908,770	xxx	37,263	xxxxxxx				
	All other	15	39	xxxxxx	43,536	xxx	2,138	xxxxxxx	272,592	xxx	10,582	xxxxxxx				
	TOTAL SHEETS	27	40	13,255,610	740,642	65.9	58,679	25,064	3,703,234	67.2	328,720	75,866				
	Strip—Hot rolled	24	41	3,525,110	110,597	37.0	5,415	11,654	554,335	37.9	31,745	62,019				
	Cold rolled	35	42	1,313,360	45,229	40.6	1,035	xxxxxxx	274,169	50.2	7,110	xxxxxxx				
	Wheels (car, rolled steel)	5	43	419,035	11,946	33.6	317	xxxxxxx	85,699	49.2	2,262	xxxxxxx				
	Axles	5	44	472,280	3,886	9.7	94	xxxxxxx	36,002	18.3	1,627	xxxxxxx				
	Track spikes	11	45	327,275	9,326	34.4	553	xxxxxxx	49,192	36.2	2,193	xxxxxxx				
	All other	3	46	9,100	985	127.8	-	xxxxxxx	4,529	119.8	-	xxxxxxx				
	TOTAL STEEL PRODUCTS	133	47	xxxxxx	3,576,860	xxx	476,761	289,653	17,160,063	xxx	2,151,107	1,154,327				
Estimated total steel finishing capacity based on a yield from ingots of 68.9 %																
				48	53,714,800	xxxxxx	72.2	xxxxx	xxxxxxx	xxxxxxx	71.7	xxxxxxx	xxxxxxx			
IRON PRODUCTS	Pig iron, ferro manganese and spiegel	27	49	xxxxxx	403,329	xxx	40,786	88,980	2,113,173	xxx	135,223	519,981				
	Ingot moulds	4	50	xxxxxx	32,133	xxx	495	xxxxxxx	155,596	xxx	1,177	xxxxxxx				
	Bars	10	51	160,600	2,142	15.7	7	123	11,489	17.2	86	892				
	Pipe and tubes	3	52	109,377	3,018	32.6	15	xxxxxxx	14,240	31.3	460	xxxxxxx				
	All other	3	53	71,180	945	15.7	38	219	5,015	17.0	849	1,377				
TOTAL IRON PRODUCTS (ITEMS 51 to 53)				12	54	276,247	6,105	26.1	60	342	30,744	26.8	1,395	2,269		

Total Number of Companies Included - 153

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current month 3,287,207 N.T.; 72.2 % of Finishing Capacity.
To date 16,005,736 N.T.; 71.7 % of Finishing Capacity.
The above tonnages represent 68.9 % of the ingots produced by companies whose products are included above.

The Iron Age Comparison of Prices

Advances Over Past Week in Heavy Type; Declines in Italics

	July 16, 1940	July 9, 1940	June 18, 1940	July 18, 1939
Flat Rolled Steel: (Cents Per Lb.)				
Hot rolled sheets	2.10	2.10	2.10	2.00
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.00
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Tin and Terne Plate: (Dollars Per Base Box)				
Tin plate	\$5.00	\$5.00	\$5.00	\$5.00
Manufacturing ternes ...	4.30	4.30	4.30	4.30
Bars and Shapes: (Cents Per Lb.)				
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Wire and Wire Products: (Cents Per Lb.)				
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.40
Rails: (Dollars Per Gross Ton)				
Heavy rails	\$40.00	\$40.00	\$40.00	\$40.00
Light rails	40.00	40.00	40.00	40.00
Semi-Finished Steel: (Dollars Per Gross Ton)				
Rerolling billets	\$34.00	\$34.00	\$34.00	\$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Wire Rods and Skelp: (Cents Per Lb.)				
Wire rods	2.00	2.00	2.00	1.92
Skelp (grv'd)	1.90	1.90	1.90	1.90

Pig Iron:

	July 16, 1940	July 9, 1940	June 18, 1940	July 18, 1939
(Per Gross Ton)				
No. 2 fdy., Philadelphia..	\$24.84	\$24.84	\$24.84	\$22.84
No. 2, Valley furnace....	23.00	23.00	23.00	21.00
No. 2, Southern Cin'ti...	23.06	23.06	23.06	21.06
No. 2, Birmingham	19.38	19.38	19.38	17.38
No. 2, foundry, Chicago†.	23.00	23.00	23.00	21.00
Basic, del'd eastern Pa...	24.34	24.34	24.34	22.34
Basic, Valley furnace ...	22.50	22.50	22.50	20.50
Malleable, Chicago†	23.00	23.00	23.00	21.00
Malleable, Valley	23.00	23.00	23.00	21.00
L. S. charcoal, Chicago...	30.34	30.34	30.34	28.34
Ferromanganese‡	120.00	120.00	120.00	80.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton. ‡For carlots at seaboard.

Scrap:

	July 16, 1940	July 9, 1940	June 18, 1940	July 18, 1939
(Per Gross Ton)				
Heavy melt'g steel, P'gh..	\$19.00	\$19.75	\$20.75	\$15.75
Heavy melt'g steel, Phila.	18.75	19.00	20.25	15.75
Heavy melt'g steel, Ch'go	17.375	17.375	18.75	13.625
Carwheels, Chicago	19.00	19.00	19.00	12.75
Carwheels, Philadelphia..	20.75	21.75	22.75	16.00
No. 1 cast, Pittsburgh...	19.75	20.75	20.75	15.25
No. 1 cast, Philadelphia..	21.25	21.75	22.25	16.25
No. 1 cast, Ch'go (net ton)	16.75	16.75	17.25	12.75

Coke, Connellsville:

	July 16, 1940	July 9, 1940	June 18, 1940	July 18, 1939
(Per Net Ton at Oven)				
Furnace coke, prompt...	\$4.25	\$4.25	\$4.00	\$3.75
Foundry coke, prompt...	5.25	5.25	5.25	4.75

Non-Ferrous Metals:

	July 16, 1940	July 9, 1940	June 18, 1940	July 18, 1939
(Cents per Lb. to Large Buyers)				
Copper, electro., Conn.*.	11.50	11.50	11.50	10.25
Copper, Lake, New York.	11.50	11.50	11.50	10.25
Tin (Straits), New York	51.25	53.00	57.00	48.50
Zinc, East St. Louis....	6.25	6.25	6.25	4.50
Lead, St. Louis.....	4.85	4.85	4.85	4.70
Antimony (Asiatic), N.Y.	16.50	16.50	16.50	14.00

*Mine producers only.

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 109 to 118 herein. On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Composite Prices . . .

FINISHED STEEL				PIG IRON				SCRAP STEEL			
July 16, 1940	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.
One week ago	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.
One month ago	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.	2.261c. a Lb.
One year ago	2.236c. a Lb.	2.236c. a Lb.	2.236c. a Lb.	2.236c. a Lb.	2.236c. a Lb.	2.236c. a Lb.	2.236c. a Lb.	2.236c. a Lb.	2.236c. a Lb.	2.236c. a Lb.	2.236c. a Lb.
High				High				High			
1940	2.261c., Jan. 2	2.211c., Apr. 16	2.261c., Jan. 2	2.211c., Apr. 16	2.261c., Jan. 2	2.211c., Apr. 16	2.261c., Jan. 2	2.211c., Apr. 16	2.261c., Jan. 2	2.211c., Apr. 16	2.261c., Jan. 2
1939	2.286c., Jan. 3	2.236c., May 16	2.286c., Jan. 3	2.236c., May 16	2.286c., Jan. 3	2.236c., May 16	2.286c., Jan. 3	2.236c., May 16	2.286c., Jan. 3	2.236c., May 16	2.286c., Jan. 3
1938	2.512c., May 17	2.211c., Oct. 18	2.512c., May 17	2.211c., Oct. 18	2.512c., May 17	2.211c., Oct. 18	2.512c., May 17	2.211c., Oct. 18	2.512c., May 17	2.211c., Oct. 18	2.512c., May 17
1937	2.512c., Mar. 9	2.249c., Jan. 4	2.512c., Mar. 9	2.249c., Jan. 4	2.512c., Mar. 9	2.249c., Jan. 4	2.512c., Mar. 9	2.249c., Jan. 4	2.512c., Mar. 9	2.249c., Jan. 4	2.512c., Mar. 9
1936	2.249c., Dec. 28	2.016c., Mar. 10	2.249c., Dec. 28	2.016c., Mar. 10	2.249c., Dec. 28	2.016c., Mar. 10	2.249c., Dec. 28	2.016c., Mar. 10	2.249c., Dec. 28	2.016c., Mar. 10	2.249c., Dec. 28
1935	2.062c., Oct. 1	2.056c., Jan. 8	2.062c., Oct. 1	2.056c., Jan. 8	2.062c., Oct. 1	2.056c., Jan. 8	2.062c., Oct. 1	2.056c., Jan. 8	2.062c., Oct. 1	2.056c., Jan. 8	2.062c., Oct. 1
1934	2.118c., Apr. 24	1.945c., Jan. 2	2.118c., Apr. 24	1.945c., Jan. 2	2.118c., Apr. 24	1.945c., Jan. 2	2.118c., Apr. 24	1.945c., Jan. 2	2.118c., Apr. 24	1.945c., Jan. 2	2.118c., Apr. 24
1933	1.953c., Oct. 3	1.792c., May 2	1.953c., Oct. 3	1.792c., May 2	1.953c., Oct. 3	1.792c., May 2	1.953c., Oct. 3	1.792c., May 2	1.953c., Oct. 3	1.792c., May 2	1.953c., Oct. 3
1932	1.915c., Sept. 6	1.870c., Mar. 15	1.915c., Sept. 6	1.870c., Mar. 15	1.915c., Sept. 6	1.870c., Mar. 15	1.915c., Sept. 6	1.870c., Mar. 15	1.915c., Sept. 6	1.870c., Mar. 15	1.915c., Sept. 6
1931	1.981c., Jan. 13	1.883c., Dec. 29	1.981c., Jan. 13	1.883c., Dec. 29	1.981c., Jan. 13	1.883c., Dec. 29	1.981c., Jan. 13	1.883c., Dec. 29	1.981c., Jan. 13	1.883c., Dec. 29	1.981c., Jan. 13
1930	2.192c., Jan. 7	1.962c., Dec. 9	2.192c., Jan. 7	1.962c., Dec. 9	2.192c., Jan. 7	1.962c., Dec. 9	2.192c., Jan. 7	1.962c., Dec. 9	2.192c., Jan. 7	1.962c., Dec. 9	2.192c., Jan. 7
1929	2.236c., May 28	2.192c., Oct. 29	2.236c., May 28	2.192c., Oct. 29	2.236c., May 28	2.192c., Oct. 29	2.236c., May 28	2.192c., Oct. 29	2.236c., May 28	2.192c., Oct. 29	2.236c., May 28

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

Based on average for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Summary of the Week

WHILE some steel companies, particularly those engaged mainly in the lighter products, have experienced a slight flattening out of orders in the past week as compared with the last week of June and the first week of July, this is believed to have only temporary significance as the initial requirements of the National Defense Program will shortly make themselves felt.

Production is holding, the rate for the industry being estimated as unchanged from last week at 87½ per cent. Aggregate steel orders in the first half of July ran ahead of those of the first half of June, but the rate of increase during June is apparently not being maintained this month. Nevertheless, for most companies orders have been moderately in excess of shipments and backlogs are not being reduced, except perhaps in sheets and strip, in which new buying has been light since the June 30 deadline on specifications against low-priced commitments.

The bulk of new business now is running to the heavier products—semi-finished steel, shell billets, plates, bars and structural steel. This trend is likely to continue as the National Defense Program unfolds.

AN early indication of the effect which government buying will have on the steel industry is indicated by awards of fabricated structural steel, amounting to 49,000 tons, the largest weekly total in more than a year and comparing with 14,500 tons in the previous week. Not all of this, of course, is National Defense work, but a considerable part of the bulge is accounted for by such projects. For example, 4000 tons is for an addition to the Lockheed-Vega Aircraft plant, 1200 tons for an addition to the Vultee Aircraft plant and 2000 tons for hangars for the naval air station at Alameda, all in California. Other defense awards for construction are 1400 tons for the Navy and Munitions Building, Washington, 1000 tons for a fabricating shop for the Bath Iron Works, Bath, Me., which is engaged in Navy work, and 900 tons for a shop extension at Patterson air field, Dayton, Ohio. However, the largest awards are for work that was in progress before the defense program took shape, these being 10,000 tons for Long Island Railroad grade elimination and 7545 tons for transmission towers for the Southern California Edison Co.

Other defense orders to reach the steel mills include more than 30,000 tons of ship plates required by an Eastern shipyard engaged in Navy contracts, but the deliveries are spread through to 1942. Original estimates of the amount of steel, other than armor plate and special steel, required for the 92 ships involved in the new Navy program have been found to be too low. Instead of the published estimate of 110,000 tons, the total is estimated by the Navy Department at 248,000 tons.

The five-year amortization formula worked out in Washington covering new plants or additions to plant

• Recent rapid increases in order volume not being maintained, but incoming tonnage still exceeds shipments . . . National defense work beginning to be felt, particularly in structural steel . . . Electric furnace capacity being expanded . . . Scrap composite price declines 33c.

or equipment necessitated by defense work, together with the government's plan of letting construction contracts on a cost plus basis, has already resulted in the elimination of some red tape and the acceleration of the defense program.

Placing of a new contract for 627 tanks with the American Car & Foundry Co. is to be followed by other tank contracts, probably one with a motor car manufacturer.

ELECTRIC furnace steel making capacity, described as "The Keystone of the Arch" in the defense program, is undergoing a considerable expansion to provide armor plate for tanks, special quality steels for airplanes, etc. In addition to whatever new capacity may be installed at the Naval Ordnance plant at Charleston, W. Va., at least three steel companies are putting in large electric furnaces for making alloy steel for various defense requirements. By fall the electric furnace capacity of the country will have been enlarged by at least 300,000 tons annually.

Although the railroads continue to deny the need of large-scale equipment purchases, inquiries from individual roads continue to appear. Several that are pending total more than 8500 freight cars. Some roads are putting out "feelers" regarding early placement of rail orders not usually acted upon until fall.

AUGMENTING other expected business, the British Purchasing Commission will henceforth place regularly each week orders for 100,000 to 150,000 tons of steel with American mills. Export business with neutral countries is dull. Tin plate is one item noticeably affected, operations of these mills having declined to 74 per cent.

A fairly early announcement of fourth quarter steel prices, probably before Aug. 15, is expected because of the prevalent desire of buyers to cover requirements ahead. No advances are in contemplation as far as known.

While scrap prices are showing more resistance, the decline has not been checked. THE IRON AGE scrap composite price is down 33c. from last week to \$18.38.

The Industrial Pace . . .

DESPITE a spurt in heavy construction awards to the highest level of the year to date, THE IRON AGE index of capital goods activity in the past week failed to regain the level prevailing in the pre-holiday week. At the close of the past week the index stood at 82.0, as compared with 80.6 in the holiday week and 87.7 in the week preceding the holiday.

The only component of the index to rebound to its position previous to the Independence Day week was the construction series. The index of this series for the past week was 59.8, as against 56.1 in the week previous to the holiday week.

Automobile assemblies are declining more rapidly than the seasonal trend and over the past three weeks the index for this series has lost over 20 points. The steel series is four points below its pre-holiday level, the Pittsburgh factor has lost two points in the same period.

The lumber carloading series, usually characterized by movements of very modest proportions, registered an unexpectedly heavy loss in the holiday period, the index number dropping from 65.9 to 55.9, despite adjustment for the shorter work week.

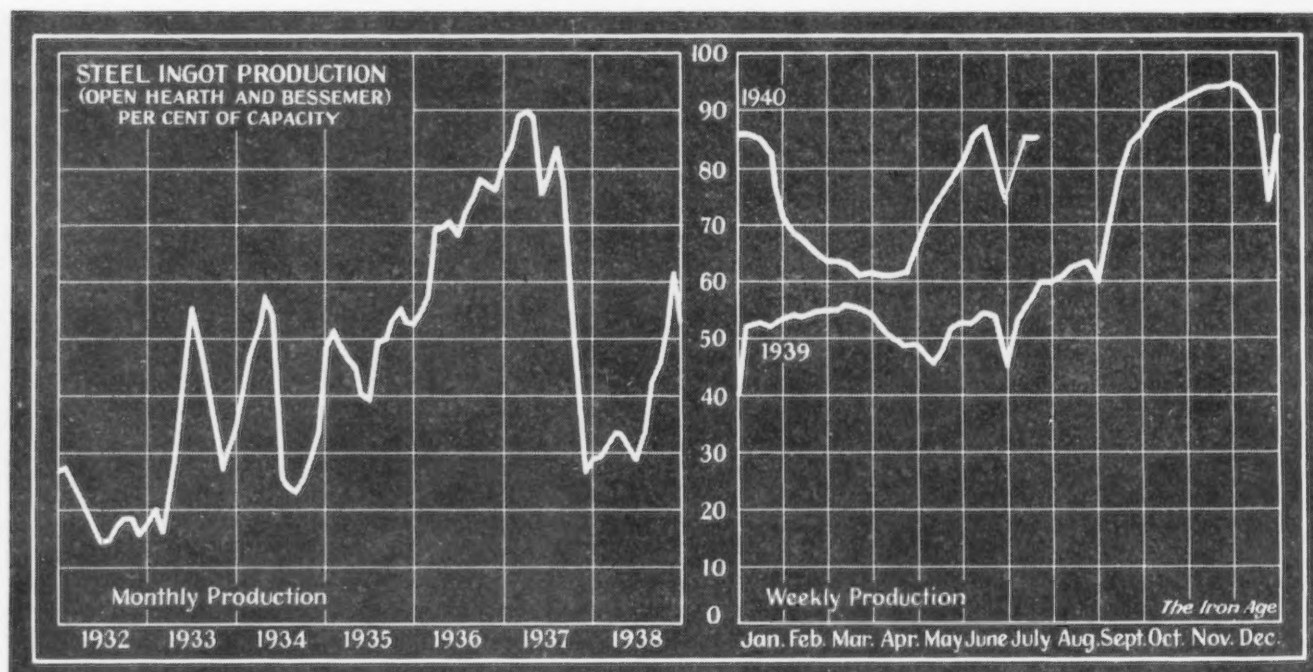
As previously pointed out, there exist factors in production methods, such as the annual changeover period in the automobile industry, which frequently

interrupt the trends of the index, but do not necessarily establish new trends. With this in mind, it appears reasonable to assume, on the basis of the factors present in the current picture, that the index is not at its peak and that the 90-mark may be broken by the end of July when automobile model change-over period is ended.

Not wholly unexpected was the improvement registered in the finished steel shipments of U. S. Steel Corp. in June, as shown in the accompanying graph. The month's deliveries, 1,209,684 tons, were the highest since December, 1939, and were at a rate equal to 76.1 per cent of the corporation's rolled and finished steel capacity. In view of the heavy buying movement in June, it is likely that a further rise will be shown in July deliveries, but it is doubtful if the peak of the fall of 1939, 1,443,969 tons in December, will be exceeded.

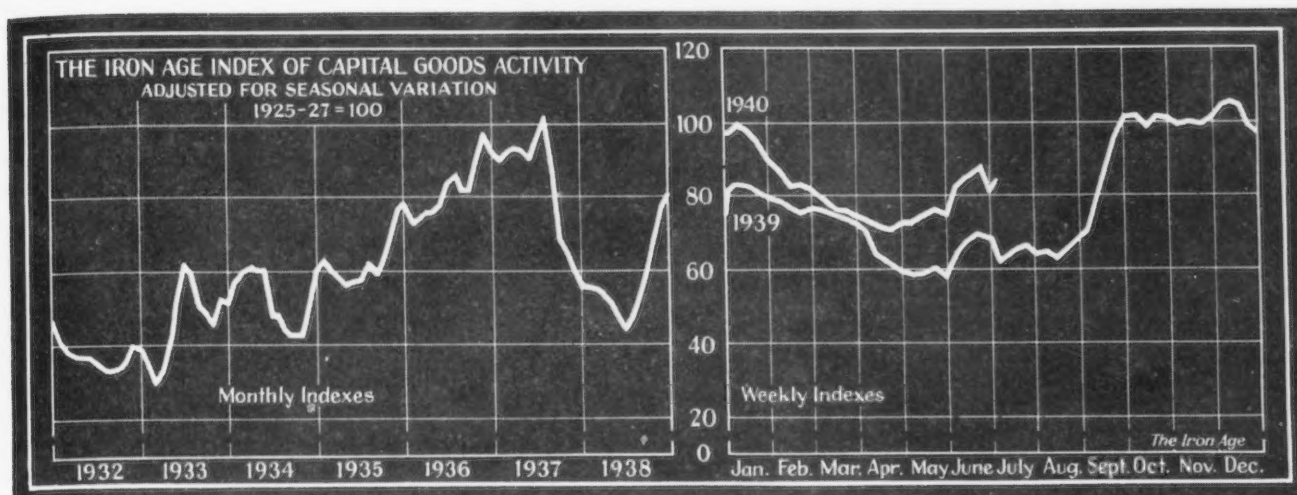
Prices of finished steel, as measured by THE IRON AGE composite, have remained on an even keel for the past 11 weeks. Previous to that there was a three-week period of price cutting on sheets and strip. The current position of the composite, 2.261¢ per lb., compares with 2.236¢ ruling at this time a year ago. The dip shown from May to June, 1939, reflects another period of price cutting. A similar dip will be noted in the fall of 1938.

Ingot Rate Remains at 87½% of Capacity



District Ingot Production, Per Cent of Capacity		Pitts-	Chicago	Valleys	Phila-	Cleve-	Buffalo	Wheel-	Detroit	Southern	S. Ohio	West-	St. Louis	East-	Aggre-
		burgh			delphia	land		ing		River		ern		ern	gate
Current Week		83.0	94.5	88.0	88.0	66.0	100.0	99.0	95.5	96.0	96.0	65.0	76.5	75.0	87.5
Previous Week		79.0	95.0	89.0	88.0	81.0	100.0	99.0	95.5	96.0	90.0	65.0	76.5	75.0	87.5

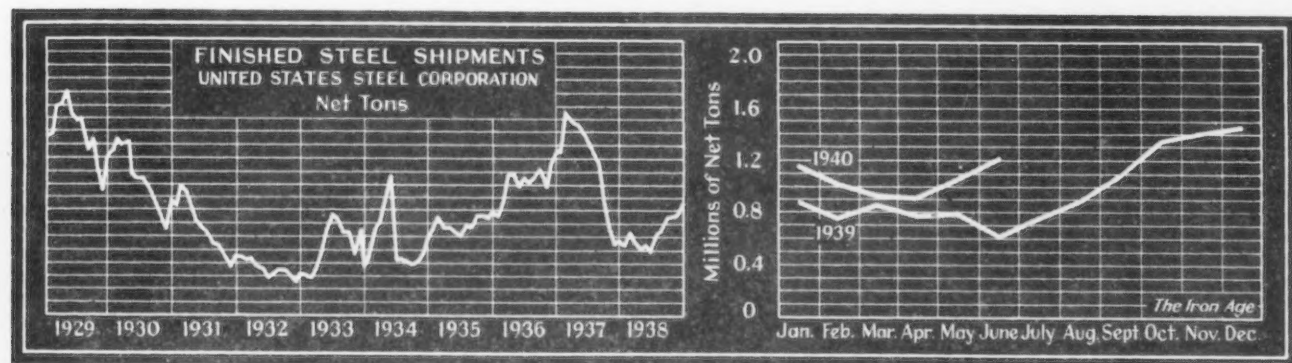
Index Fails to Regain Pre-Holiday Level



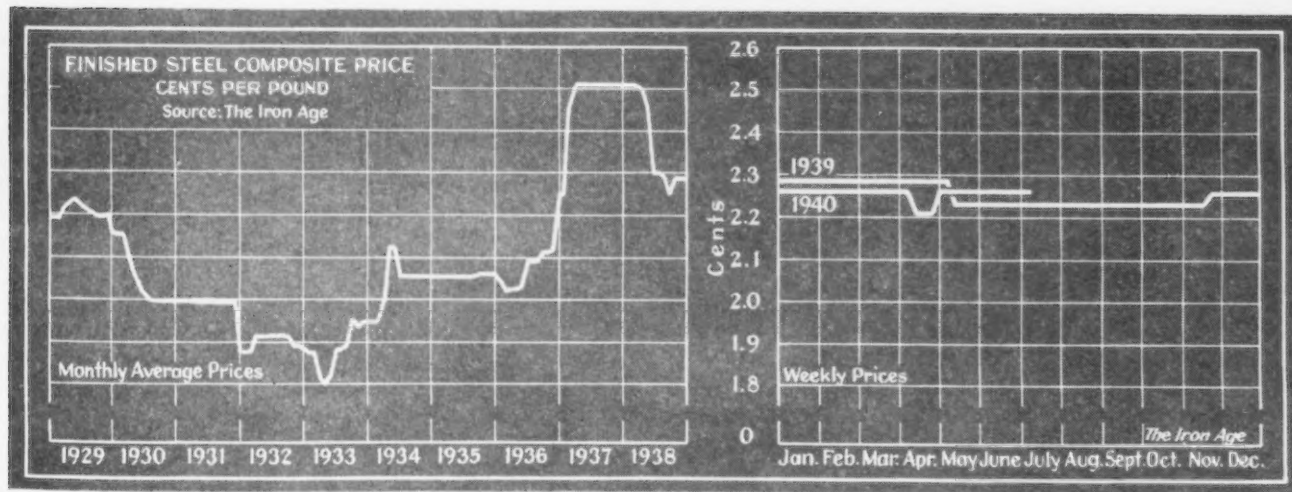
					July 15	July 13
▼Components	Week Ended ➤	July 13	July 6	June 15	1939	1929
Steel ingot production ¹		128.1	112.2	122.3	73.9	141.4
Automobile production ²		60.0	61.7	83.8	59.5	127.3
Construction contracts ³		59.8	56.1	55.3	68.4	119.2
Forest products carloadings ⁴		55.9	65.9	61.2	49.2	124.8
Pittsburgh output and shipments ⁵		106.3	107.0	101.4	69.3	130.9
COMBINED INDEX		82.0	80.6	84.8	64.1	128.8

Sources: ¹THE IRON AGE; ²Wards Automotive Reports; ³Engineering News-Record; ⁴Association of American Railroads; ⁵University of Pittsburgh. Indexes of forest products carloadings and activity in Pittsburgh area reflect conditions as of week ended July 6. Other indexes cover week of July 13.

June Shipments of U. S. Steel at New Peak for 1940



Finished Steel Prices Unchanged for Past 11 Weeks



Market News

...THE WEEK'S ACTIVITIES IN IRON AND STEEL

New Business

... Little letup in volume of orders ... British buying to continue heavy

There has been little or no letup in the volume of incoming steel specifications at PITTSBURGH during the past week. Domestic demand continues strong and export requirements from Britain are increasing substantially each week.

Domestic steel business in the past two weeks has shown exceptionally wide diversification, indicating that consumers are still of the opinion that steel supplies, in some cases at least, will be difficult to obtain later on in the year. Deliveries are already quite extended on sheets, wide plates, and forging bars, while promises on alloy steel are much further advanced than was the case a month ago. Even though domestic demand levels off within the coming weeks it is the opinion in reliable quarters that requirements from the British will more than make up the difference.

The British Purchasing Commission within the past two weeks has made phenomenal strides in expediting the estimating of requirements and the ordering of steel products. It has been learned on good authority that the British Purchasing Commission, in the coming months, will be steadily placing steel orders including all types of finished steel products, semi-finished, and shell steel to the extent of between 100,000 and 150,000 tons a week. It is believed schedules are being worked out so that the steel mills will have advance information of what type of product they may expect to be ordered.

With respect to the United States rearmament program, rough estimates on the amount of steel necessary tend to confirm previous estimates published by THE IRON AGE, indicating a consumption of between 6,000,000 and 8,000,000 tons of steel a year for the next two years.

With a tremendous amount of

preparedness contracts having been placed within the past week and with many steel and fabricating companies rapidly rushing plans to be in position to begin production of bombs, tanks, shells, and other defense items before the end of this year, significance of the preparedness program as it affects the steel industry will probably be felt by the fourth quarter.

Original estimates of the amount of plain steel required for the Navy's new program of 92 ships have been found to be too low. Instead of the published estimate of 110,000 tons, exclusive of armor plate and other special steels, the total should be about 248,000 tons, according to the Navy Department.

At virtually all CHICAGO sales offices, new business so far this month is running behind the comparable period for June. The lack of sheet specifications this month is undoubtedly the major factor in these declines. The greatest drop that was reported, however, was about 25 per cent and in some cases incoming business is still in excess of shipments. Excluding sheets from consideration, new steel business differs little from this time a month ago. Hot rolled carbon bars, shapes and plates are all in good demand and no signs of a letup are in sight.

Orders are being received from car builders for construction of the freight cars reported in recent weeks. The business already on the books and inquiries at hand indicate sustained activity in this field for many months. Total number of cars to be ordered this year have been estimated at from 50,000 to 100,000. To date this year slightly more than 12,000 cars have been ordered.

Many companies are building up precautionary stocks but as yet only in sheets has this movement attained important proportions. Fear seems to be centering around possible delays in delivery rather than speculation on account of price.

Chicago steel companies to date have apparently received very little

direct business from Army or Navy purchasing commissions for the national defense program. Large tonnages are expected, however, and it is believed that backlogs will rise substantially when this demand is felt.

New business in the PHILADELPHIA area for the first two weeks of July was about on a par with the same period in June, which in several respects represents a gain since sheet specifications were unusually heavy in June and are practically absent since July 1, and there was not a holiday in the June period. Important ship tonnages have come in and large railroad tonnages began to come out over the past weekend. Structural awards are relatively light, but there are a number of State highway bridges in sight. In the last fortnight, anticipatory buying of pipe on the part of oil companies has been an important factor.

A possibly significant trend is noted in New York. Sales in the first half of July were equal to or slightly in excess of those of the first half of June, but were not generally equal to those of the last half of June. In the past week there has been some flattening out of aggregate demand even as compared with the first week of July, but whether this will be a continuing trend over the next few weeks cannot be determined from one week's development.

Expansion of airplane manufacturing facilities was evidenced this week by the award of more than 5000 tons for plant expansion in southern California by Lockheed-Vega and Vultee. Small plants for the manufacture of aircraft parts and accessories have sprung up in great numbers during the past few weeks in that area, nearly all of them in anticipation of British and national defense buying.

A \$30,000,000 contract for Naval construction at Pearl Harbor, T. H., and Midway, Johnston, and Wake Islands in the Pacific Ocean, has been let on a cost plus fixed fee basis to Raymond Concrete Pipe Co., Turner Construction Co., and Hawaiian Dredging Co., who are

at present engaged in similar work in the Pacific, and J. H. Pomeroy Co. and Morrison-Knudsen Co. A \$3,500,000 contract for constructing Naval shore facilities at San Diego, Cal., was awarded on a cost plus basis to M. H. Golden, San Diego, and a \$1,750,000 cost plus contract for buildings at the San Diego Marine Corps base went to Los Angeles Contracting Co. and O. W. Karn, Los Angeles. Substantial quantities of construction steel, particularly reinforcing bars, will be required for these projects, although purchases may be in small lots.

Aggregate domestic buying of steel is irregularly lower at CLEVELAND and YOUNGSTOWN but will not be reflected immediately in steel production because of backlogs. Actually rolling mill operations are being stepped up this week at several Ohio points.

The largest order backlogs in relation to production capacity exist in electric furnace alloy steel divisions. Because of the extended delivery some Ohio producers have been forced to turn down new business. Ordinary hot rolled alloy bars are difficult to obtain under 12 weeks and deliveries on other items range up to 16 and 18 weeks.

Heavy buying of finished steel by the British and moderate railroad purchases are also among the highlights of the market at CLEVELAND.

Prices

... An early announcement of fourth quarter quotations expected

With backlogs mounting, especially on bars, plates, sheets, and heavy products, and with the certainty that an even tighter situation will result later in the year, it is expected that fourth quarter steel prices will be announced before Sept. 1, the normal time for such an announcement.

In the past few years, there has been a disposition to follow no set plan in the announcement of quarterly prices, but rather to take into account the current market situation. Because of the necessity for planning ahead and because soon some products will have been booked in sufficient volume to extend deliveries greatly, it is believed that a fourth quarter price announce-

ment is a probability sometime between Aug. 1 and Aug. 15.

Although subsequent circumstances might alter the picture, no price increases for the fourth quarter seem likely.

Semi-Finished Steel

... Orders lower in past week but ahead of last month

Total semi-finished steel bookings at PITTSBURGH within the past week have been in less volume than the week before. However, orders so far this month are ahead of a month ago to a substantial extent and no letup in demand is looked for in the near future. Mills are working on recent British shell steel orders, which represent in many cases replacement of previously placed French shell steel business. It is said that the British Purchasing Commission has made substantial headway in the past two weeks in clearing up the difficulties arising from the French surrender and, as a result, additional shell steel business, as well as ordinary semi-finished steel specifications, are expected in the near future.

Pig Iron

... Youngstown output at highest July level since '29

Orders and shipments are running ahead of those of June in some districts, such as PITTSBURGH, but new business in most areas continues light, a natural result of heavy buying last month and an easier scrap market.

Production in the YOUNGSTOWN area is higher than for any July since 1929, with 22 of 25 furnaces melting. Although shipments both of pig iron and foundry coke at CHICAGO are exceeding June by a substantial margin, sellers there believe this month as a whole will finish only slightly ahead of June.

Ordering continues light in the NEW YORK area, where a slight improvement is noted in the foundry melt. PHILADELPHIA reports that because of high machine tool activity, low phosphorus grades are in demand, and that stiffer prices are being talked of on these grades because of the restricted domestic ore situation and cutting off of

some foreign low phosphorus ores from northern Africa.

CINCINNATI shipments of pig iron this month are slightly under those of June, with a small gain in the stove manufacturers' melt reported. Although foundry operations have not changed much at BUFFALO, war orders are beginning to have an effect. Notwithstanding the lack of new buying in NEW ENGLAND, other than carlots, the melt in that area is estimated up three points to 77 per cent of capacity.

About 25,000 tons of the low phosphorus pig iron, which will be made from Chateaugay ores by the Republic Steel Corp at the Troy, N. Y., furnace, which it has leased, will be shipped to Great Britain. The Troy furnace went into blast last week.

Plates

... Orders placed for steel for new Navy program

From 30,000 to 35,000 tons of steel plates have been ordered in the last week by the New York Shipbuilding Corp. in connection with the recent Navy awards for a battleship and cruisers. Commitments were made with three large plate producers, and shipments are to extend into 1942. The Pennsylvania Railroad, having made suitable financial arrangements for its car program through the sale of equipment trust certificates, has begun to place its initial commitments for plates and bars for the first month of fabrication at Altoona. Receipt of steel is to begin not later than July 27.

Total plate specifications at PITTSBURGH in the past week were somewhat ahead of those received in the previous week, and orders so far this month are running ahead of the corresponding period a month ago. Deliveries are becoming quite extended in some cases. In view of the impending United States armament program, some plate consumers are placing orders for prompt shipment at this time to avoid the possibility of a shortage later in the year. No small portion of present plate requirements are coming from extensive car repair programs at various railroad shops, while a steadily increasing amount of plate tonnage is going for shipbuilding.

Plates are in good demand at Chicago. Wide plates, such as are required by tank fabricators, are particularly active, and some of the wide mills are hard pressed. Delivery is no problem on narrower plates. Large orders were received last week from Chicago district railroad car builders, and much more similar tonnage is expected in the near future.

Miscellaneous plate business in

the eastern Pennsylvania district is holding up well and several local mills are operating close to capacity and above. Added to railroad and shipyard activity, there is fair buying on the part of tank builders, refineries and jobbers.

Specifications for the plates for the welded steel anti-aircraft mounts recently awarded to the York Safe & Lock Co. are said to be very rigidly drawn, including

magnaflux inspection for pipes and seams and causing some plate makers to avoid bidding on this work.

Buoys for Tiburon, Cal., involving about 1000 tons of fabricated plates have been awarded by the Navy. An oil tank inquiry for a San Francisco oil company will take over 1000 tons.

Bolts, Nuts and Rivets

... Specifications this month good volume

Bolt and nut producers at CLEVELAND who felt July would lag in sales are surprised to find specifications for the first two weeks above the volume received in the same part of May. In some quarters it is said this month may be better than July, 1937, from the standpoint of new business. Auto makers evidently are specifying earlier and in greater volume. Railroads and other industries are more active and trying for protection further ahead.

Reinforcing Steel

... Awards total 8100 tons, new projects 15,750

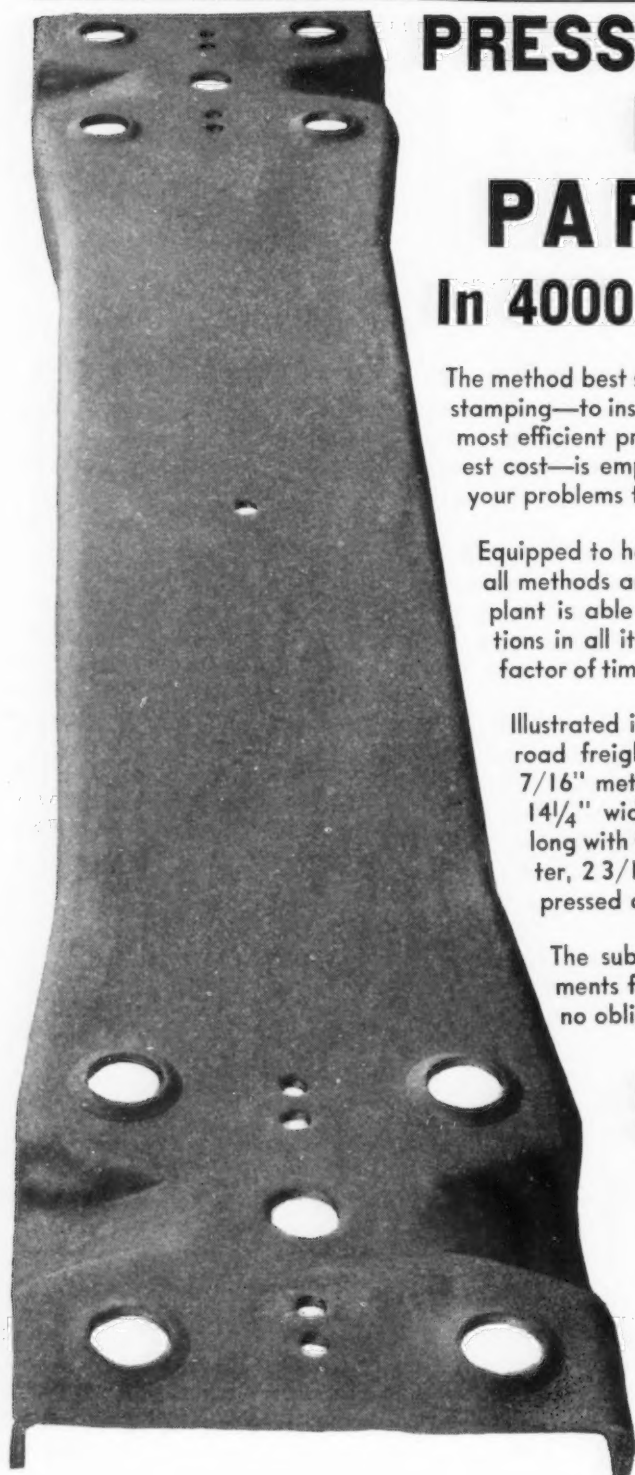
Reinforcing steel awards total 8100 tons and include 4300 tons at San Francisco for appraiser's stores and immigration station.

Among 15,750 tons reported for new projects are 7000 tons for two units for the Bonneville power plant; 3300 tons at Detroit for the St. James housing project, and 2300 tons for the Orange County, Cal., feeder pipe line.

Merchant Bars

... Production heavy, but new orders flatten out slightly

In some cases bar bookings in the past week in PITTSBURGH have not been up to the level of the week before but for the district as a whole the volume of specifications has been substantial and there is no evidence of a significant decline in new business. Demand is well diversified and is quite heavy for small bars and shapes. Recent British orders will also help mill backlogs and, considering the pressure for other steel products, most bar mills have large sized backlogs ahead of them. Obviously much of



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the bar buying is for inventory purposes in order to eliminate the possibility of a shortage when the United States armament program gets under way on a large scale.

At CLEVELAND and YOUNGSTOWN production continues strong and shipments are rising. A large inquiry for rounds for a machinery builder headlines prospective business. Brisk activity on the part of forgers has been encountered.

Demand for hot rolled carbon bars at CHICAGO continues at about the same level as a week ago and a month ago. With most sheet buyers covered for at least a month or more, bars have become the major item on the weekly order list at most CHICAGO sales offices. Manufacturers of farm implements, farm tractors, industrial tractors, and commercial forging are especially active. Steel warehouse stocks of merchant bars are being maintained at a high level.

Plans of the Ordnance Department, United States Army, are said to include placement of 9,000,000 rounds of anti-aircraft shells of 1-in. caliber. These shells are about 4 in. long.

Wire Products

... Rods and wire in good demand, merchant items less active

Aggregate new tonnages on the daily basis at CLEVELAND has not regained the level that prevailed before the July 4 holiday. However, order backlogs insure unfaltering production. While July sales of merchant wire products are fair, the effect of the heavy coverage by jobbers in May and June is still being felt.

Wire rod and manufacturers' wire specifications at PITTSBURGH in the past week expanded somewhat from the volume in the week before. Some of this business has been from automotive sources but on the whole the demand has been well diversified. Merchant wire product demand is not strong at present, as most consumers had stocked up fairly well more than a month ago.

Demand for manufacturers' wire at CHICAGO is running about even with a month ago. Orders from local producers of automobile springs for 1941 models have not yet come through, but this business is looked for momentarily.

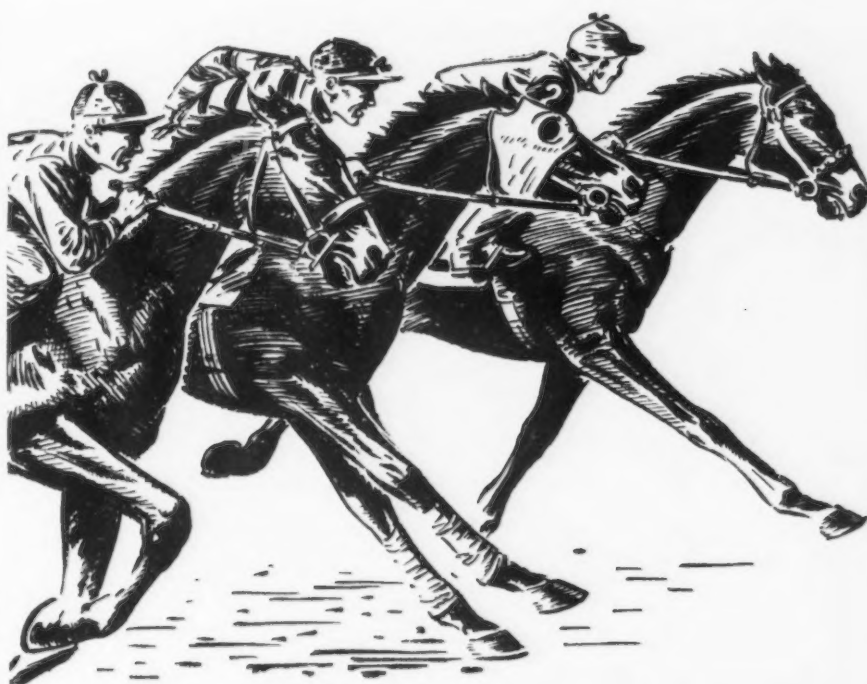
Sheets and Strip

... Some laxity in enforcement of June 30 deadline

There has apparently been some laxity in the enforcement by the sheet and strip mills of the June 30 deadline for specifications against low-priced commitments. Some buyers have been permitted

to add to their commitments, while in a number of instances entirely new commitments have been taken at the old prices, which were \$4 a ton below current quotations.

No substantial tonnages have been forthcoming which would be considered as an adequate testing of the current price level, nor is any such tonnage expected much be-



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fore September when some automotive companies will be in the market again. Releases against hot rolled specifications at PITTSBURGH are strong and in some cases rolling mill facilities are being taxed to the utmost. Releases on cold rolled tonnage have not been as numerous as on hot rolled.

Aggregate new tonnage is light also at CLEVELAND but the numerical volume of orders, coming principally from small buyers, is good.

From all sides pressure for deliveries is being exerted. Export buying, while well distributed, lacks any flare and is incapable of filling the void caused by reduced domestic demand. Backlogs for hot rolled material are more extended in proportion to capacity than cold rolled, according to some sellers. Continuous strip mill widths may be obtained fairly promptly. Production in the Shenango Valley has been stepped up during the past week

with some mills operating as high as 17 turns per week.

Chicago sheet mills are engaged in working down their backlogs, most of which consists of low-priced tonnage. With the exception of demand from the automobile industry for 1941 models, new orders for sheets are not expected in great number for several weeks yet. Some of this automobile buying will undoubtedly be done at the published price.

Sheet steel demand in the Southern Ohio district declined during the past week to an average of about 65 per cent of capacity.

Makers of galvanized sheets have added length extras for sheets under 18 in. in length. Heretofore the length extras applied only down to 18 in. The new extras for galvanized and alloy products, in lengths under 18 in., are 40c. a 100 lb. on galvanized sheet gage No. 16 and heavier, 60c. a 100 lb. on 17 to 24 gages, and 70c. a 100 lb. on 25 to 30 gage.

Tubular Goods

... Pipe orders are a little more numerous

All tubular goods divisions at CLEVELAND and YOUNGSTOWN report brisk new orders during the past 10 days. Merchant pipe, casing and small pipe lines are most active on the domestic side. Bookings include export tonnages for South America.

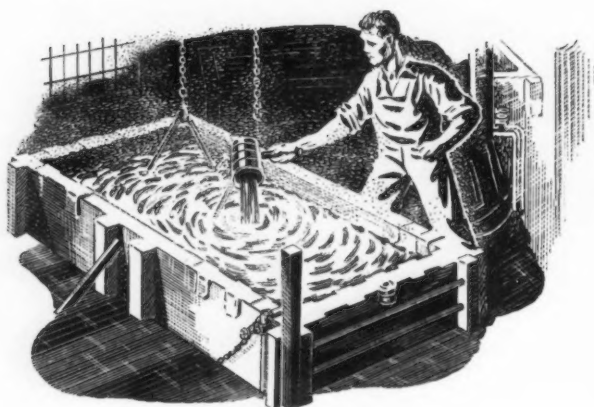
Shipments are starting this week on approximately 6000 tons of 8 $\frac{3}{8}$ in. pipe which Youngstown Sheet & Tube Co. is furnishing for the 120-mile line of the Montana Dakota Utilities Co. from Fort Peck to Glendive, Mont., and approximately 2000 tons of miscellaneous sizes for distribution systems and field lines.

Iron Ore

... Great Lakes fleet working at near-maximum capacity

All but three ships of the American Great Lakes ore fleet of 297 vessels were active July 15, according to the latest report of C. C. Lindemann, statistician for M. A. Hanna Co., Cleveland. The 98.99 per cent current activity compares with 98 per cent on June 15 and only 68.21 per cent activity on July 15, 1939.

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Railroad Buying

... Equipment inquiries total more than 8500 cars

Including the 2545 freight cars which the Pennsylvania Railroad will build in its own shops, the number of freight cars placed so far this month is 4678.

The Norfolk & Western has ordered 500 hopper cars from Virginia Bridge Co. and 500 hoppers from Bethlehem Steel Co.

The Atlantic Coast Line Railroad is inquiring for a total of 1665 freight cars, types as follows: 100 auto box, 600 box cars, 300 hopper cars, 100 phosphate cars, 15 covered cement cars, 200 drop-in gondola cars, 50 stock cars and 300 ballast cars.

The Union Pacific is inquiring for 1000 50-ton ballast cars.

The Atlantic Coast Line Railroad, the Illinois Central, the Southern Pacific and the Union Pacific inquiries, plus 550 box cars still to be purchased by the Norfolk & Western, bring the total of cars on inquiry and soon to be ordered to 8565.

The allocation of the 1100 freight cars ordered by the Chesapeake & Ohio Railroad and reported in THE IRON AGE, July 4, 1940, issue, was as follows: 300 box cars to American Car & Foundry, 200 box to Pullman Standard Car Mfg. Co., 200 box to Mt. Vernon Car Co., 200 box to General American Transportation Co., all of the above 40 ft. 6 in. cars, 100 50 ft. 6 in. box cars to Greenville Steel Car Co., 50 caboose cars to St. Louis Car Co., and 50 caboose cars to Maygar Car Corp.

The Chesapeake & Ohio has asked ICC authority to issue \$2,500,000 in equipment trust certificates to finance the purchase of these cars.

Up to Tuesday of this week, 16,409 freight cars have been ordered since the first of the year and include those to be manufactured by car builders or at railroad shops.

The American Car & Foundry Co. has received a \$1,000,000 order from Colombia, South America, for 23 light weight passenger coaches and 13 trailers.

The Reading Railroad announces that it will place an order shortly for 10 diesel switching locomotives.

The possibility of an important

rail buying movement is indicated by "feelers" put out by some roads, one asking about delivery of 30,000 tons, which will not be wanted until fall. The Erie has ordered 3600 gross tons of rails from Carnegie-Illinois and 350 tons from Bethlehem.

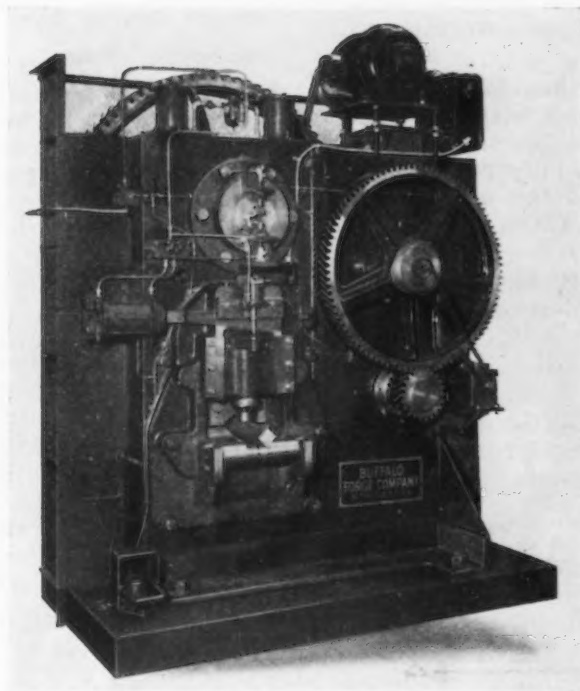
Nickel Plate Road has awarded 2200 tons of tie plates. The order was distributed to Republic Steel Corp., Inland Steel Co., Youngstown Sheet & Tube Co. and Wheeling Steel Corp.

Tin Plate

... Operations slightly lower ... Export trade has declined

Tin plate operations this week have leveled off two points to 74 per cent. Specifications in the past week have been fairly heavy but releases were not as strong as they were a month ago. The entry of Italy into the European war has seriously affected tin plate exports to Mediterranean ports.

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BUFFALO FORGE COMPANY
492 Broadway Buffalo, N. Y.
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Kitchener, Ont.

BILLET SHEARS

Machine Tools

... SALES, INQUIRIES AND MARKET NEWS

Amortization Plan Helpful

Cleveland

••• Outside of Presidential approval of the long advocated five-year amortization plan for defense industries, the past week has brought little of a helpful nature for the industry. The British continue to thumb through the thousands of French orders they have taken over; the licensing of exports has been accompanied by widespread confusion; and most producers are still unaware of just how big a job the United States armament program will prove to be.

Production has tapered, but whether this is a temporary development cannot be ascertained. It may be due to pile-ups of finished machines plus the effect of the customary vacations for plant employees.

The aircraft industry's plans are none too clear. Some parts of the aircraft industry are still buying to fill old Allied orders.

Revision of certain aspects of the law on maximum allowable profits is considered necessary, particularly in the case of the machine tool industry, where turn-

over per year is not as large as in some other industries.

••• June operating capacity of the machine tool industry stood at 92.3 per cent compared to 92.5 per cent for May, according to the latest report of the National Machine Tool Builders' Association, Cleveland. The industry's capacity, measured in terms of payroll hours, is 27.5 per cent above September, 1939.

Foreign Buying Slackens

Cincinnati

••• Demand for machine tools has slackened. This is largely due to the fact that foreign demand, following the assumption by Great Britain of French orders, has decreased rather sharply. On the other hand, domestic ordering has shown a marked improvement, but has not been sufficiently active to take up the slack caused by the decrease in export demand. Russia and Japan are still in the market, but no new ordering has been reported. These interests are still negotiating for additional equipment with delivery probably being

one of the most important items in obtaining contracts. No effect of the export licensing has yet been felt, but manufacturers are all set to comply with the order.

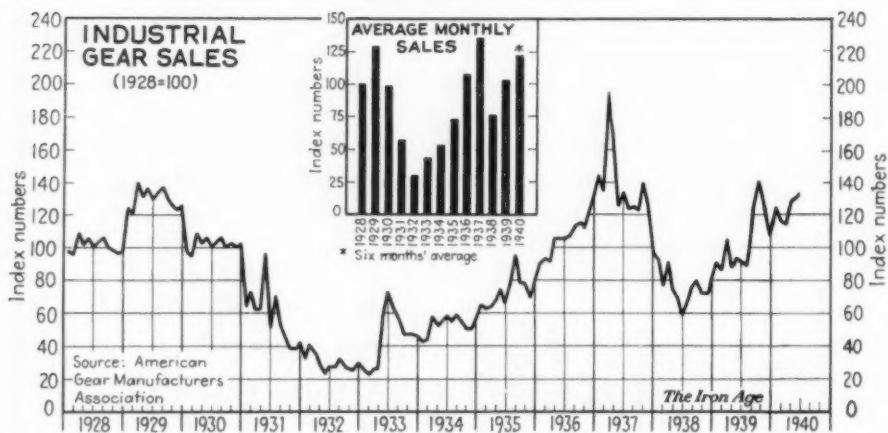
Backlogs are still substantial, with the estimate averaging about a year's capacity production. The development of new machine operators under short term instructions, tends to ease somewhat the labor situation. It is still a fact, however, that a dearth of skilled mechanics is retarding further expansion in production.

Many Inquiries at Chicago

Chicago

••• New orders for machine tools at Chicago are being received at virtually an undiminished rate from a month ago. Inquiries continue numerous and sales offices are busily engaged in working out quotations. A number of district plants, particularly those engaged in heavy manufacture, such as railroad equipment, electrical machinery, etc., are asking prices on machine tools for use in formulating bids on the manufacture of tanks, armored scout cars, and the like. Inquiries from Federal agencies, such as the Rock Island Arsenal and the various procurements divisions of the Army and Navy are being issued constantly. Next week, for example, the arsenal will ask bids from a private manufacturer on 700 medium tanks and a quantity of carriages for the 75 mm. gun. It is probable that joint orders will be awarded to some plants, each of which possesses some essential equipment for ordnance purposes but is not self-contained. By this means, it is hoped to avoid the long delays necessary in tooling up at one plant only for an armament order. Machining can be accomplished at several plants, and final assembly at still another. The arsenal itself is buying new machinery systematically, inquiries being received almost weekly. It is worthy of note that some of the red tape formerly connected with arsenal purchasing practice has been eliminated.

Six Months' Gear Sales 35% Above Year Ago



SALES of industrial gears in the first six months of the current year are 35 per cent ahead of the corresponding period of 1939, the American Gear Manufacturers Association reports. The association's average index for the first half of this year was 124, as compared with 92 in the first half of 1939.

The June index of sales was 129, 3 per cent below the May index of 133, but 43 per cent above the index position of June, 1939.

Non-Ferrous Metals

... MARKET ACTIVITIES AND PRICE TRENDS

New York, July 16—The copper market continues to be characterized by complete lassitude, with consumers not too well supplied with metal but still not interested in taking on new commitments at least at present price levels. Illustrating the current dull condition is the approximate 16,000 tons of red metal which has been sold so far this month, as against almost 85,000 tons for the corresponding period last month. The major producers continue to quote 11.50c. a lb., but metal is easily available from custom smelters and small producers on the basis of 10.87½c. a lb. Perhaps this lower figure has even been shaded on occasion to draw in orders, but such shading has been very quiet with little or no indication of the action on the surface. As in the domestic market, the export situation is practically dead, with prices slipping gradually lower to a level of 10.25c. a lb. f.a.s. New York or West Coast ports.

Zinc

Consumers have quite good tonnage on books and are drawing steadily against these commitments rather than entering new orders. The result has been a quiet market condition which will undoubtedly persist until unfilled order books begin to approach a level necessitating replenishment. The price remains firm at 6.25c. a lb., East St. Louis. Sales last week totaled 2646 tons, with shipments of 5826 tons. Unfilled orders now stand at 48,498 tons. In the Tri-State ore district the zinc concentrate production has recovered to 8550 tons from 6870 tons during the previous holiday week. Sales remained about the same, 7300 tons. Prices are still firm at \$41 for both mill and float grades.

Lead

The market is devoid of features, with consumers only mildly interested in new commitments. July positions on the whole are practically fully covered, but August is only about 30 per cent ac-

counted for. The price basis remains firmly at 4.85c. a lb., St. Louis, with no change in sight. Lead ore continues to be firm in the Joplin market at \$57.34 on a quoted metal contract basis, while in the outside markets carloads are available at \$57 with the regular penalty of \$2 to \$3 for smaller lots.

Tin

There is considerably more activity in this metal than appears on the surface. The government is in the market for 75,000 tons of metal at a pegged price of 50c. a lb., c.i.f., but is giving priority to those consumers who wish to buy metal. The result has been a

fairly steady flow of metal into consuming plants with excess tonnages going to government stocks. The asking price for early deliveries continues at 51.25c., which has been unchanged for the past seven days. Greater quantities of metal are coming from Bolivia, and activity in that country is being watched closely inasmuch as concentrate will have to originate there if or when a tin smelting industry is established in the United States. In England the government is holding on to all tin supplies and permitting no exporting. The price there today was £265 for prompt metal and £264 for three months.

(Non-Ferrous Prices on Page 113)

Scrap

... MARKET ACTIVITIES AND QUOTATION TRENDS

... Although it appeared last week that the bottom of the current reaction in scrap prices might have been reached, early this week further evidence of price weakness appeared at Pittsburgh, sending the average price of No. 1 steel down 75c. there. This together with a decline of 25c. in the average at Philadelphia and no change at Chicago has resulted in a drop of 33c. in the composite price of No. 1, to \$18.38, following a decline of only 21c. the week before. Mill sales have been light or absent in these districts. Biggest drop took place at Youngstown, where prices are down \$1. based on moderate sized mill sales. A sale of 10,000 tons at Buffalo, mostly No. 2 steel, depressed the market there 50c. Railway sales also reflect lower prices. Dealer buying prices have been lowered 50c. at St. Louis, Detroit and New York, but Cincinnati dealers have held to last week's levels. Except at Boston, export buying prices are softer, New York exporters having dropped offering prices for No. 1 and 2 by \$1, reflecting the restriction of the export market.

Pittsburgh

Following a week of inactivity and a semblance of sparring between buyers and sellers, the market has turned softer this week on open-hearth grades. A small lot of No. 1 heavy melting has been sold into consumption to a plant with a short haul at \$18.50. Offers have been made by brokers to a buyer at \$19 a ton, and brokers are picking up steel a little more freely at \$19. On appraisal, No. 1 heavy melting is quoted this week at \$18.75 to \$19.25, down 75c. a ton. Heavy melting steel on the Pennsylvania Railroad list was sold into consumption at around \$20 a ton, which represents a drop from the last sale. Some buyers and brokers feel that the market is scraping bottom.

Chicago

The position of heavy melting steel in this market is unchanged from a week ago. Mill sales at \$17.50 have been reported, and brokers can still fill their needs, such as they are, at \$17.25. Specialties are showing some strength while other grades are slightly weaker. No. 2

steel is still being shipped to Hamilton, Ont., in large tonnages, and a boat left this week for that port from Milwaukee.

Philadelphia

Small tonnages of No. 1 steel have sold at \$18.50, but it is the consensus of the trade that quantities of 1000 tons or over would command not less than \$19. Some railroad material was bought at better than \$19, which would have netted a higher delivered price in this district. Trading is very light and some dealers are without orders for No. 1, which is nominally quoted at \$18.50 to \$19, down 25c. on the average from last week's flat \$19. No. 2 steel is definitely softer on recent sales. Dealers are busy delivering on old orders and are showing little interest in making sales at current levels. Export shipments are slower, and buying prices have softened.

Youngstown

No. 1 heavy melting steel is quoted down \$1 a ton this week to a range of \$18.50 to \$19, reflecting moderate sized sales to one mill in the district. Shipments are not restricted as closely this week as was the case at the start of this month.

Cleveland

Mills are taking in scrap more freely here than in the Valley, which has resulted in a stronger undertone locally and the market is showing more resistance to the decline than is the case in the Valley. No. 1 heavy melting steel is quoted at \$18.50 to \$19 a ton this week, down 25c.

Buffalo

The market eased off again this week with the report of a sale of 10,000 tons of scrap to the largest consumer in the district. The tonnage was composed mainly of No. 2 steel and allied grades and was reported to have been made on the basis of \$18.50 to \$19 for No. 1 heavy melting steel. All other items, including blast furnace grades, are marked down 50c.

St. Louis

Dealer buying prices of some items were down 50c. a ton as compared with the preceding week, but the market is steady. There were no mill sales, and, while no deals are pending, brokers believe that this week will see some purchases by mills. The movement from the country is subsiding as farmers begin work in the fields. Railroad lists: Southern, 570 tons.

Cincinnati

Movement of scrap on contract is at

fair rate, but new contracting is virtually nil. Reports of improved activity in other areas have brought a stronger undertone to the current market, thus supporting dealers' bids at the present level.

Birmingham

There has been no change in prices. Buyers are proceeding cautiously. Three of the largest buyers here who set the pace for the market have retired reportedly for the remainder of the month.

Detroit

Indications that scrap prices in the Detroit area had leveled off late last week were upset Monday by receipt of authoritative information that hydraulic compressed bundles sold by one of the major auto body builders had brought a figure approximately 50c. below the previous week's high quotation in THE IRON AGE. It is understood that the bundles sold at \$16.50 a ton. There has been in the last week some drying up of supplies of scrap but little activity is reported in the area.

Boston

A boat here is loading for England and another is scheduled for Providence to load for Japan. These and other boats due at both ports before Aug. 15 serve to keep the export market active at unchanged prices. For domestic delivery the market continues comparatively quiet with prices more or less unsettled. Ford barges continue to load No. 1 heavy melting steel and bundled scrap at Providence for Cleveland delivery, and occasional carlots of bundled skeleton and steel turnings are moving to the Pittsburgh district.

Toronto

Activity in the Canadian iron and steel scrap markets continues at record levels. Mills are taking all offerings of scrap and also are renewing contracts to the full extent of dealers' possibilities of supply. Foundries and other users of cast scrap and stove plate have been active in the market recently, making special efforts to place contracts for future needs and also taking all offerings for spot delivery. No further change has appeared in price lists, although current quotations are strong.

New York

There is practically no buying here of No. 1 steel for domestic consumption and prices for scrap on cars are down 50c. on steel making grades. The edge is definitely off the export market, although there has been some Japanese buying, and buyers are offering \$1 less for truck lots of Nos. 1 and 2 delivered to barges.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	\$18.75 to \$19.25
Railroad heavy mltng.	19.75 to 20.25
No. 2 heavy mltng.	17.25 to 17.75
Railroad scrap rails	20.50 to 21.00
Rails 3 ft. and under	22.50 to 23.00
Comp. sheet steel	18.75 to 19.25
Hand bundled sheets	17.75 to 18.25
Heavy steel axle turn.	17.25 to 17.75
Machine shop turnings	13.50 to 14.00
Short shov. turnings	15.50 to 16.00
Mixed bor. & turn.	11.50 to 12.00
Cast iron borings	11.50 to 12.00
Cast iron carwheels	20.00 to 20.50
Heavy breakable cast	16.50 to 17.00
No. 1 cupola cast	19.50 to 20.00
RR. knuckles & coup.	24.50 to 25.00
Rail coil springs	24.50 to 25.00
Rail leaf springs	24.50 to 25.00
Rolled steel wheels	24.50 to 25.00
Low phos. billet crops	25.00 to 25.50
Low phos. punchings	25.00 to 26.00
Low phos. heavy plate	23.00 to 23.50
Railroad malleable	23.50 to 24.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	\$18.50 to \$19.00
No. 2 hvy. mltng. steel	17.00 to 17.50
Hydraulic bund., new	18.50 to 19.00
Hydraulic bund., old	15.50 to 16.00
Steel rails for rolling	22.00 to 22.50
Cast iron carwheels	20.50 to 21.00
Hvy. breakable cast	19.00 to 19.50
No. 1 cupola cast	21.00 to 21.50
Mixed yard (f'd'y) cast	18.00 to 18.50
Stove plate (steel wks.)	15.00 to 15.50
Railroad malleable	22.50 to 23.00
Machine shop turn.	12.50 to 13.00
No. 1 blast furnace	11.50 to 12.00
Cast borings	11.50 to 12.00
Heavy axle turnings	16.50 to 17.00
No. 1 low phos. hvy.	24.00 to 24.50
Couplers & knuckles	24.00 to 24.50
Rolled steel wheels	24.00 to 24.50
Steel axles	23.00 to 23.50
Shafting	24.50 to 25.00
Spec. iron & steel pipe	17.00 to 17.50
Cast borings (chem.)	14.00 to 14.50

CHICAGO

Delivered to Chicago district consumers:

Hvy. mltng. steel	\$17.25 to \$17.50
Auto. hvy. mltng. steel	
alloy free	16.25 to 16.50
No. 2 auto steel	13.75 to 14.25
Shoveling steel	17.25 to 17.50
Factory bundles	16.75 to 17.00
Dealers' bundles	15.25 to 15.50
No. 1 busheling	16.25 to 16.50
No. 2 busheling, old	8.00 to 8.50
Rolled carwheels	20.50 to 21.00
Railroad tires, cut	21.00 to 21.50
Railroad leaf springs	18.50 to 19.00
Steel coup. & knuckles	20.50 to 21.00
Axle turnings	16.25 to 16.75
Coil springs	22.00 to 22.50
Axle turn. (elec.)	17.75 to 18.25
Low phos. punchings	20.50 to 21.00
Low phos. plates 12 in. and under	20.50 to 21.00
Cast iron borings	10.50 to 11.00
Short shov. turn.	11.50 to 12.00
Machine shop turn.	11.50 to 12.00
Rerolling rails	21.50 to 22.00
Steel rails under 3 ft.	19.75 to 20.25
Steel rails under 2 ft.	21.00 to 21.50
Angle bars steel	20.00 to 20.50
Cast iron carwheels	18.75 to 19.25
Railroad malleable	22.00 to 22.50
Agric. malleable	14.75 to 15.25

Per Net Ton

Iron car axles	23.50 to 24.00
Steel car axles	22.00 to 22.50
Locomotive tires	15.00 to 15.50
Pipes and flues	11.50 to 12.00
No. 1 machinery cast	16.50 to 17.00
Clean auto. blocks	17.25 to 17.75
No. 1 railroad cast	15.00 to 15.50
No. 1 agric. cast	13.50 to 14.00
Stove plate	10.75 to 11.25
Grate bars	12.50 to 13.00
Brake shoes	12.50 to 13.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	\$18.50 to \$19.00
No. 2 hvy. mltng. steel	17.50 to 18.00
Low phos. plate	20.50 to 21.00
No. 1 busheling	17.75 to 18.25
Hydraulic bundles	18.00 to 18.50
Machine shop turn.	13.00 to 13.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	\$18.50 to \$19.00
No. 2 hvy. mltng. steel	17.50 to 18.00

Comp. sheet steel....\$18.00 to \$18.50

Light bund. stampings	14.50 to 15.00
Drop forge flashings	17.25 to 17.75
Machine shop turn.	12.00 to 12.50
Short shov. turn.	12.50 to 13.00
No. 1 busheling	18.00 to 18.50
Steel axle turnings	17.50 to 18.00
Low phos. billet and bloom crops	23.00 to 23.50
Cast iron borings	12.25 to 12.75
Mixed bor. & turn.	12.25 to 12.75
No. 2 busheling	12.25 to 12.75
No. 1 cupola cast	20.50 to 21.00
Railroad grate bars	14.00 to 14.50
Stove plate	14.00 to 14.50
Rails under 3 ft.	23.00 to 23.50
Rails for rolling	23.00 to 23.50
Railroad malleable	21.50 to 22.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	\$18.50 to \$19.00
No. 2 hvy. mltng. steel	16.50 to 17.00
Scrap rails	21.50 to 22.00
New hvy. b'ndled sheets	16.50 to 17.00
Old hydraul. bundles	15.00 to 15.50
Drop forge flashings	16.50 to 17.00
No. 1 busheling	16.50 to 17.00
Machine shop turn.	11.00 to 11.50
Shov. turnings	12.50 to 13.00
Mixed bor. & turn.	11.00 to 11.50
Cast iron borings	11.00 to 11.50
Knuckles & couplers	22.50 to 23.00
Coil & leaf springs	22.50 to 23.00
Rolled steel wheels	22.50 to 23.00
No. 1 machinery cast	19.50 to 20.00
No. 1 cupola cast	18.00 to 18.50
Stove plate	15.50 to 16.00
Steel rails under 3 ft.	23.50 to 24.00
Cast iron carwheels	18.00 to 19.00
Railroad malleable	22.00 to 23.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting	\$15.75 to \$16.75
No. 1 hvy. melting	15.00 to 15.50
No. 2 hvy. melting	14.00 to 14.50
No. 1 locomotive tires	17.50 to 18.00
Misc. stand. sec. rails	17.50 to 18.00
Railroad springs	18.50 to 19.00
Bundled sheets	10.50 to 11.00
Cast bor. & turn.	7.50 to 8.00
Machine shop turn.	9.00 to 9.50
Heavy turnings	13.00 to 13.50
Rails for rolling	19.00 to 19.50
Steel car axles	20.50 to 21.00
No. 1 RR. wrought	12.50 to 13.00
No. 2 RR. wrought	14.00 to 14.50
Steel rails under 3 ft.	20.00 to 20.50
Steel angle bars	17.50 to 18.00
Cast iron carwheels	17.00 to 17.50
No. 1 machinery cast	18.50 to 19.00
Railroad malleable	18.00 to 18.50
Breakable cast	15.50 to 16.00
Stove plate	11.00 to 11.50
Grate bars	13.00 to 13.50
Brake shoes	11.50 to 12.00

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel	\$14.50 to \$15.00
No. 2 hvy. mltng. steel	13.00 to 13.50
Scrap rails for mltng.	20.00 to 20.50
Loose sheet clippings	9.25 to 9.75
Hydrau. b'ndled sheets	13.75 to 14.25
Cast iron borings	6.00 to 6.50
Machine shop turn.	7.00 to 7.50
No. 1 busheling	10.50 to 11.00
No. 2 busheling	4.75 to 5.25
Rails for rolling	21.50 to 22.00
No. 1 locomotive tires	16.00 to 16.50
Short rails	22.00 to 22.50
Cast iron carwheels	16.00 to 16.50
No. 1 machinery cast	18.50 to 19.00
No. 1 railroad cast	17.00 to 17.50
Burnt cast	10.50 to 11.00
Stove plates	10.50 to 11.00
Agricul. malleable	15.00 to 15.50
Railroad malleable	18.00 to 18.50
Mixed hvy. cast	15.75 to 16.25

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting steel	\$16.50
No. 2 hvy. melting steel	15.50
No. 1 busheling	14.00
Scrap steel rails	15.00
Steel rails under 3 ft.	17.50
Rails for rolling	17.50
Long turnings	5.00
Cast iron borings	7.50
Stove plate	11.00
Steel axles	18.00
No. 1 RR wrought	14.00
No. 1 cast	16.00
No. 2 cast	12.50
Cast iron carwheels	13.00
Steel car wheels	16.00

DETROIT

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 heavy melting	\$14.00 to \$14.50
No. 2 heavy melting	13.00 to 13.50
Borings and turnings	9.50 to 10.00
Long turnings	9.00 to 9.50
Short shov. turnings	10.00 to 10.50
No. 1 cast	18.50 to 19.00
Automotive cast	15.00 to 15.50
Hvy. breakable cast	11.50 to 12.00
Stove plate	16.00 to 16.50
Hydraul. Comp. sheets	14.50 to 15.00
New busheling	13.00 to 13.50
Sheet clips	14.00 to 14.50
Flashings	17.00 to 17.50
Low phos. plate	17.00 to 17.50

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel	\$14.00 to \$14.50
No. 2 hvy. mltng. steel	13.00
Hvy. breakable cast	15.00 to 15.50
No. 1 machinery cast	17.00 to 17.50
No. 2 cast	15.00 to 15.50
Stove plate	11.00 to 11.50
Steel car axles	20.00 to 20.50
Shafting	20.00 to 20.50
No. 1 RR. wrought	14.50 to 15.00
No. 1 wrought long	13.00 to 13.50
Spec. iron & steel pipe	12.00 to 12.50
Rails for rolling	16.50 to 17.00
Clean steel turnings	8.50 to 9.00
Cast borings*	8.50 to 9.00
No. 1 blast furnace	8.50 to 9.00
Cast borings (chem.)	10.00 to 11.00
Unprepared yard scrap	8.00 to 8.50
Light iron	6.00 to 6.50

Per gross ton delivered local foundries:

No. 1 machin. cast	\$19.00 to \$20.00
No. 2 cast	18.00 to 18.50

* \$1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton:

Breakable cast	\$13.50 to \$14.00
Machine shop turn.	8.00 to 8.15
Mixed bor. & turn.	6.00
Bun. skeleton long.	11.25 to 11.50
Shafting	18.50 to 18.75
Stove plate	9.65 to 9.75
Cast bor. chemical	8.00 to 8.50

Per gross ton delivered consumers' yards:

Textile cast	\$17.00 to \$19.00
No. 1 machine cast	17.00 to 19.00

Per gross ton delivered dealers' yards:

No. 1 hvy. mltng. steel	\$14.00 to \$14.50
No. 2 steel	13.00 to 13.50

PACIFIC COAST

Per net ton delivered to consumer:

	San Fran.	Los Ang.	Seattle
No. 1 hvy. mltng. steel	\$13.00	\$13.00	\$14.00
No. 2 hvy. mltng. steel	12.00	12.00	13.00
Bundles	11.00	11.00	12.00

CANADA

Dealers' buying prices at these yards, per gross ton:

	Toronto	Montreal
Low phos. steel	\$11.50	\$11.00
No. 1 hvy. mltng. steel	11.25	10.75
No. 2 hvy. mltng. steel	10.00	9.50
Mixed dealers steel	8.75	8.25
Drop forge flashings	9.75	9.25
New loose clippings	8.75	8.25
Busheling	6.00	5.50
Scrap pipe	7.75	7.25
Steel turnings	7.25	6.75
Cast borings	6.75	6.25
Machinery cast	20.00	19.00
Dealers' cast	19.00	18.00
Stove plate	14.50	13.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel	\$15.00
No. 2 hvy. mltng. steel	13.00
No. 2 cast	14.00
Stove plate	12.50

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel	\$15.50 to \$16.00
No. 2 hvy. mltng. steel	14.00 to 14.50
Rail (scrap)	15.50 to 16.00
Stove plate	12.25 to 12.50

Philadelphia, delivered alongside boats, Port Richmond

No. 1 hvy. mltng. steel	\$17.00 to \$17.50
No. 2 hvy. mltng. steel	16.00 to 16.50

Construction Steel

...STRUCTURAL STEEL, REINFORCING BARS, PLATES, PILING, ETC.

Fabricated Steel

Lettings jump to 49,125 tons from 14,500 tons last week; new projects also higher at 23,600 tons; plate awards call for 2825 tons.

AWARDS NORTH ATLANTIC STATES

- 11,000 Tons, Far Rockaway, N. Y., continuation No. 4, for Long Island Railroad Co., to Harris Structural Steel Co., Plainfield, N. J.
- 1400 Tons, Washington, addition, Navy and Munitions building, to Bethlehem Steel Co., Bethlehem, Pa.
- 1000 Tons, Bath, Me., fabricating shop for Bath Iron Works, to American Bridge Co., Pittsburgh.
- 810 Tons, Stamford, Conn., power station extension, to Bethlehem Fabricators, Inc., Bethlehem, Pa.
- 650 Tons, Springfield, Mass., resin plant, for Monsanto Chemical Co., to Belmont Iron Works, Philadelphia.
- 630 Tons, Bethlehem, Pa., Eugene G. Grace Hall, Lehigh University, to Bethlehem Steel Co., Bethlehem, Pa.
- 500 Tons, Sussex, N. J., State grade separation, route 23, to Bethlehem Steel Co., Bethlehem, Pa.
- 330 Tons, New York, addition to No. 2 Water-side station for Consolidated Edison Co., to American Bridge Co., Pittsburgh.
- 330 Tons, New York, office building alterations for Insurance Co. of North America, to Ingalls Iron Works Co., Birmingham.
- 310 Tons, Williamsville, N. Y., State bridge RC-40-38, to Bethlehem Steel Co., Bethlehem, Pa.
- 305 Tons, Binghamton, N. Y., power plant building No. 60 for State, to Bethlehem Steel Co., Bethlehem, Pa.
- 240 Tons, Hancock, Md., State highway bridge, to Bethlehem Steel Co., Bethlehem, Pa.
- 220 Tons, Cumberland, Md., Montgomery Ward & Co. store, to Ingalls Iron Works Co., Birmingham.
- 215 Tons, New York, reconstruction bridge, East 204th Street, to Fort Pitt Bridge Works Co., Pittsburgh.
- 200 Tons, Kingston, N. Y., reconstruction bridges for New York Central Railroad Co., to American Bridge Co., Pittsburgh.
- 150 Tons, New York, sanitation dumping board, East 60th Street, to Belmont Iron Works, Philadelphia.
- 150 Tons, Harrisburg, Pa., plant extensions, Harrisburg Steel Co., to Bethlehem Steel Co., Bethlehem, Pa.
- 150 Tons, Philadelphia, power house, Henry Disston & Sons Co., to Belmont Iron Works, Philadelphia.
- 145 Tons, Taunton, Mass., Nurses Home for Morton Hospital, to an unnamed bidder.
- 140 Tons, Niagara Falls, N. Y., plant building No. 1 for B. F. Goodrich Co., to Bethlehem Steel Co., Bethlehem, Pa.
- 130 Tons, Candor, N. Y., State bridge RC-40-50, to American Bridge Co., Pittsburgh.
- 120 Tons, Pittsburgh, building addition for Mine Safety Appliance Co., to American Bridge Co., Pittsburgh.

- 110 Tons, Chester County, Pa., State highway bridge, route 201, to Bethlehem Steel Co., Bethlehem, Pa.
- 106 Tons, New Wilmington, Pa., building for Westminster College, to Pittsburgh Bridge & Iron Co., Pittsburgh.

THE SOUTH

- 1125 Tons, Fayette County, Tex., bridge ERP; 180 Tons to Austin Brothers, Dallas, Tex., 945 tons to Illinois Steel Bridge Co., Jacksonville, Ill.
- 400 Tons, Cocoa, Fla., State bridge over Indian River, to Bethlehem Steel Co., Bethlehem, Pa.
- 365 Tons, Jacksonville, Fla., addition to George Washington Hotel, to Aetna Iron & Steel Co., Jacksonville.
- 235 Tons, Wichita County, Tex., bridge to Austin Brothers, Dallas, Tex.
- 185 Tons, Morgantown, W. Va., Chittum Motor Co. store, to Ingalls Iron Works Co., Birmingham.
- 165 Tons, Fannin County, Tex., bridge, to Virginia Bridge Co., Roanoke, Va.
- 140 Tons, Elm Grove, W. Va., Ohio Valley Coal Co. trestle and bins, to Riverside Steel Co., Wheeling, W. Va.
- 115 Tons, White County, Ga., highway bridge, to an unnamed bidder.
- 100 Tons, Washington County, Tex., shapes and railing for underpass to North Texas Iron & Steel Co., Fort Worth, Tex.

CENTRAL STATES

- 900 Tons, Dayton, Ohio, engineering shop extension, Patterson Field, to R. C. Mahon Co., Detroit, through J. H. Marchbank Construction Co., Chicago.
- 850 Tons, Philo, Ohio, power house extension for Ohio Power Co., to Fort Pitt Bridge Works Co., Pittsburgh.
- 700 Tons, Chillicothe, Ohio, buildings for Mead Corp., to Bethlehem Steel Co., Bethlehem, Pa.
- 610 Tons, Joliet, Ill., boiler house addition for Public Service Co. of Northern Illinois, to Mississippi Valley Structural Steel Co., Decatur, Ill.
- 450 Tons, St. Louis, power plant addition for Union Electric Light & Power Co., to Mississippi Valley Structural Steel Co., St. Louis.
- 413 Tons, Chicago, grade separation, Chicago Park District, Fullerton Parkway, to Bethlehem Steel Co., Bethlehem, Pa.
- 230 Tons, Chicago, Continental Can Co. building, to Wendnagel & Co., Chicago.
- 220 Tons, Detroit, State bridge FB-1 of 82-22-4, to Wisconsin Bridge & Iron Co., Milwaukee.
- 200 Tons, Detroit, highway bridge, to Wisconsin Bridge & Iron Co., Milwaukee.
- 190 Tons, Columbus, Ind., State bridge, contract No. 1975, to Bethlehem Steel Co., Bethlehem, Pa.
- 180 Tons, Hammond, Ind., La Salle Steel Co. extension, to Joseph T. Ryerson & Son, Inc., Chicago.
- 155 Tons, Plainfield, Ind., State bridge, contract No. 1972, to Bethlehem Steel Co., Bethlehem, Pa.
- 120 Tons, Port Huron, Mich., State bridge B-1 of 77-17-23, to Yeager Bridge & Culvert Co., Port Huron.

WESTERN STATES

- 7543 Tons, Los Angeles, transmission towers for Southern California Edison Co., Boulder-Chino line and branches, to Emeco Derrick & Equipment Co., Los Angeles.
- 5000 Tons, San Francisco, appraiser's stores and immigration station, to Bethlehem Steel Co., San Francisco, through Clinton Construction Co., San Francisco, contractor.
- 4000 Tons, Burbank, Cal., Lockheed-Vega airplane plant expansion, divided between Bethlehem Steel Co., Los Angeles, and Consolidated Steel Corp., Los Angeles.
- 2000 Tons, Alameda, four land plane hangars at Naval Air Station (Specification 91851), to Bethlehem Steel Co., San Francisco, through Robert E. McKee, Los Angeles, contractor.
- 1200 Tons, Downey, Cal., Vultee Aircraft, Inc., addition; 1000 tons to Consolidated Steel Corp., Los Angeles; 200 tons to Pennsylvania Iron & Steel Co., Los Angeles.
- 470 Tons, Vancouver, Wash., carbon baking building for Aluminum Co. of America, to American Bridge Co., Pittsburgh.
- 380 Tons, Grand Lake, Colo., tunnel ribs, Specification 912, to Colorado Fuel & Iron Corp., Denver.
- 270 Tons, Anchorage, Alaska, Army air base (Invitation 225), to Milwaukee Bridge Co., Milwaukee.
- 190 Tons, Van Nuys, Cal., bridge, Sepulveda Dam, to Consolidated Steel Corp., Los Angeles.
- 180 Tons, Stockton, Cal., New Jacobs No. 1 bridge, to Minneapolis-Moline Power Implement Co., Minneapolis.
- 175 Tons, Casper, Wyo., State underpass FAGM-9 (1), to Bethlehem Steel Co., Bethlehem, Pa.
- 160 Tons, Berkeley, Cal., ice rink, to Judson-Pacific Co., San Francisco.
- 150 Tons, Ogden, Utah, State bridge over Weber River, to American Bridge Co., Pittsburgh.

PENDING STRUCTURAL PROJECTS NORTH ATLANTIC STATES

- 3700 Tons, Brooklyn, Kingsborough housing project.
- 2200 Tons, New York and Brooklyn, 150,000 ft. curbing.
- 750 Tons, New York, grade separations for Triborough Bridge Authority.
- 550 Tons, Barber, N. J., flue system for American Smelting & Refining Co.
- 550 Tons, Clinton County, highway bridge; bids July 24.
- 540 Tons, Washington, extension to buffing shop for Navy Department.
- 400 Tons, Johnson City, N. Y., State bridge PSC-8758; bids July 24.
- 400 Tons, Erie County, Pa., State highway bridge, route 304; bids July 26.
- 320 Tons, West Hartford, Conn., office, factory and boiler buildings for Jacobs Mfg. Co.; bids in.
- 250 Tons, Buffalo, store building; bids taken July 17.
- 250 Tons, Aberdeen, Md., shop building for Ordnance proving grounds; John K. Ruff, Baltimore, low bidder.

Weekly Bookings of Construction Steel

Week Ended—→	July 16, 1940	July 9, 1940	June 18, 1940	July 18, 1939	Year to Date	
					1940	1939
Fabricated structural steel awards	49,125	14,500	18,850	19,150	453,955	538,025
Fabricated plate awards	2,825	8,875	0	355	82,955	94,140
Steel sheet piling awards	4,510	200	2,100	300	26,025	39,865
Reinforcing bar awards	8,100	8,260	19,650	7,220	239,910	267,065
Total Letting of Construction Steel	64,560	31,835	40,600	27,025	802,845	939,095

- 235 Tons, Dover, N. J., bridge FA-RC-40-59; bids in.
 230 Tons, Tioga County, Pa., State highway bridge; bids July 19.
 220 Tons, Dewey Beach, Del., State bridge.
 210 Tons, Blair County, Pa., State highway bridge, route 47; Eau Claire Engineering Co., Donegal, Pa., low bidder.
 200 Tons, Manchester, Conn., buildings Nos. 60 and 68 for Orford Soap Co.
 175 Tons, Trenton, N. J., State highway bridge, route 49, section 16; Harry Eisenberg, Collingswood, N. J., low bidder.
 150 Tons, Chemung County, highway bridge; bids July 24.
 150 Tons, Quincy, Mass., telephone exchange.
 125 Tons, Westport, Conn., Compo Road bridge No. 3273; bids in.

THE SOUTH

- 340 Tons, Pickwick Dam, Tenn., power house unit No. 3 for TVA.
 330 Tons, Artesia, N. Mexico, State bridge FAS-206-F (1).
 140 Tons, Roswell, N. Mexico, State bridge FAP-163-C (1).

CENTRAL STATES

- 4700 Tons, Venice, Ill., No. 2 power plant for Union Electric Co. of Illinois.
 700 Tons, Comstock, Mich., power plant addition for Consumers Power Co.
 450 Tons, Detroit, post office garage; bids July 18.
 360 Tons, Columbia, Mo., State highway bridge; bids July 19.
 300 Tons, Chicago, repairs, Chicago Rapid Transit Co., 63rd Street line; bids July 19.
 220 Tons, Dayton, Ohio, laboratory addition, Wright Field; bids in.
 140 Tons, Columbus, Ind., building for Tabernacle Christian Church.
 110 Tons, Fond du Lac, Wis., addition for Giddings & Lewis Machine Tool Co.

WESTERN STATES

- 650 Tons, Bonneville, Ore., units 7 to 10.

- Bonneville power house foundation; bids open about Aug. 20.
 420 Tons, Nyssa, Ore., undercrossing; bids July 18.
 365 Tons, Anchorage, Alaska, Government house hangar for U. S.
 180 Tons, Fort Peck Dam, Mont., power house substructure.

CANAL ZONE

- 3700 Tons, buildings for Albrook Field; bids in.

FABRICATED PLATES

AWARDS

- 1680 Tons, Orange County, Cal., steel cylinder for feeder pipe line, to American Concrete Steel Pipe Co., Southgate, Cal.
 1000 Tons, Tiburon, Cal., Navy buoys; 700 tons to Western Pipe Steel Co., San Francisco; 300 tons to Greenville Steel Car Co., Greenville, Pa.
 125 Tons, Baytown, Tex., tanks, to Chicago Bridge & Iron Co., Chicago.
 100 Tons, Lynnfield, Mass., standpipe, to Bethlehem Steel Co., Bethlehem, Pa.

PENDING PROJECTS

- 1000 Tons, San Francisco, oil tanks.
 244 Tons, South Ogden, Utah, fabricated 12 gage 4 to 12-in. pipe for Bureau of Reclamation (Invitation 1377-D); Western Pipe & Steel Co., San Francisco, low bidder.
 200 Tons, San Francisco, pressure vessels.

SHEET PILING

AWARDS

- 4000 Tons, Denison, Tex., Denison Dam embankment and excavation, to Carnegie-Illinois Steel Corp., Chicago, through Guy F. Atkinson, Denison, contractor.
 510 Tons, Kansas City, Kan., flood wall, to Inland Steel Co., Chicago, through Koss Construction Co., Des Moines.

PENDING PROJECTS

- 105 Tons, Princeton, Cal., levee; bids July 23.

WESTERN STATES

- 4300 Tons, San Francisco, appraiser's stores and immigration station, to Bethlehem Steel Co., San Francisco, through Clinton Construction Co., San Francisco, contractor.
 200 Tons, Billings, Mont., water reservoir, to Colorado Fuel & Iron Co., Denver, through Northwest Engineering Co., contractor.
 125 Tons, Leavenworth, Wash., bridges on State highways 15 and 2, to Northwest Steel Rolling Mills, Inc., Seattle, through Goetz & Brennan, Seattle, contractors.

PENDING REINFORCING BAR PROJECTS

ATLANTIC STATES

- 545 Tons, Stamford, Conn., housing project, John Eiseley, contractor.
 150 Tons, Providence, R. I., addition to Rhode Island Hospital.
 150 Tons, Merrimack and Grafton Counties, N. H., two bridges.
 140 Tons, Brooklyn, Belt Parkway, contract E-1; bids in.
 100 Tons, Springfield, Mass., factory for Monsanto Chemical Co.

CENTRAL STATES

- 3300 Tons, Detroit, St. James Terrace housing project; bids July 30.
 637 Tons, Springfield, Ill., housing project; bids taken July 15.
 130 Tons, Osborn, Ohio, airplane repair dock, Patterson Field; Silken Brothers, contractors.
 130 Tons, Cleveland, State bridge No. CU-6-135 at Bulkley, Lake and Clifton Boulevards; Lombardo Brothers, Cleveland, low bidders on general contract.
 111 Tons, Warren County, Ohio, State highway project No. 163; DeSalvo Construction Co., Cincinnati, low bidder.
 110 Tons, Osborn, Ohio, engine test building and spray pool, Patterson Field; Charles H. Shook, contractor.
 100 Tons, Cleveland, State bridge No. CU-6-127 at Bulkley, Lake and Clifton Boulevards; Lombardo Brothers, Cleveland, low bidders on general contract.

WESTERN STATES

- 7000 Tons, Bonneville, Ore., foundation for units 7 to 10, Bonneville power house; bids open about Aug. 20.
 2300 Tons, Orange County, Cal., feeder pipe line; American Concrete & Steel Pipe Co., contractor.
 750 Tons, Burbank, Cal., Lockheed-Vega airplane plant expansion.
 200 Tons, Nyssa, Ore., undercrossing; bids July 18.
 106 Tons, San Francisco, addition to Sisters of the Good Shepherd convent.

Cast Iron Pipe

Oakville, Conn., Fire District, Watertown, Conn., has preliminary plans for a water system to cost approximately \$300,000. Bronson E. Lockwood, Litchfield Road, Watertown, is engineer, and Buck & Buck, 650 Main Street, Hartford, Conn., is construction engineer.

Manteo, N. C., will close bids on or about Aug. 1 for pipe for a water system; also for elevated steel tank and tower. Fund of about \$135,000 has been arranged for this and sewage system. Linberg Engineers, Inc., Burlington, N. C., is consulting engineer.

New Holland, Ohio, plans water pipe line system and other waterworks installation, including pumping station and water-softening plant. Cost about \$110,000. Financing in part will be arranged through Federal aid and remainder through bond issue.

Sardinia, Ohio, plans pipe lines for water system and other waterworks installation, including water-softening plant. Cost about \$35,000. Financing is being arranged through Federal aid. A. E. Kimberly, 20 East Third Street, Columbus, Ohio, is engineer.

Construction Quartermaster, Fort Moultrie, Charleston, S. C., plans 6-in. main water line from Mount Pleasant, source of supply, to connection with local field. Cost close to \$500,000.

Alexandria, La., asks bids until July 25 for 5000 ft. of 6-in. cast iron bell and spigot pipe for water system.

Lafayette, La., closes bids July 23 for 22,700 ft. of 6-in. pipe, 2925 ft. of 4-in., and 36 ft. of 16-in. for water system; also for gate valves, fire hydrants and other waterworks equipment.

Bellingham, Wash., plans new main water line from Lake Whatcom tunnel to new 72-in. tunnel, recently completed, for service for industrial plants. Cost close to \$200,000. Edward Gooch is city engineer.

Coldwater, Ohio, plans pipe line extensions in water system in eastern part of municipality. Estimates of quantity and cost are being made.

Washington, N. C., closes bids July 19 for 1795 ft. of 10-in. pipe, 7455 ft. of 8-in., and 9775 ft. of 6-in. for water system; also for about 15,000 lb. of cast iron specials, gate valves, etc. William F. Freeman, High Point, N. C., is consulting engineer.

Loda, Iroquois County, Ill., plans pipe lines for water system and other waterworks installation. Cost close to \$40,000.

Phoenix, Ariz., has taken bids on 500 to 2000 tons of 2 to 12-in. class 150 pipe, 100 to 200 hydrants, 65 to 325 tons of fittings, gate valves, valve boxes and covers.

San Diego, Cal., has taken bids on 665 tons of 24-in. pipe.

Long Beach, Cal., has awarded 600 tons of cast iron pipe to United States Pipe & Foundry Co., San Francisco.

San Bernardino, Cal., has awarded 115 tons of 4 to 6-in. pipe to United States Pipe & Foundry Co., San Francisco, and 206 tons of 8 and 12-in. pipe to National Cast Iron Pipe Co., Los Angeles.

Pipe Lines

Tennessee Gas & Transmission Co., Inc., 401 Chattanooga Bank Building, Chattanooga, Tenn., plans new welded steel pipe line from natural gas field district in Northern Louisiana to Chattanooga, Knoxville and Nashville, Tenn., and extension to Asheville, N. C., for natural gas transmission. New line will pass through Alabama, Arkansas and Mississippi to first noted points, and right of way is being secured. Company has recently secured a pipe line franchise in Knox County, Tenn. Application for permission has been made and Federal Power Commission has set date for hearing Sept. 4. John E. Buckingham is secretary and treasurer of company.

Ottumwa Gas Co., Ottumwa, Iowa, plans extensions in gas pipe line system about 10 miles. Work will be carried out soon by company forces.

Reinforcing Steel

Awards of 8100 tons; 15,750 tons in new projects

AWARDS

ATLANTIC STATES

- 440 Tons, Corning, N. Y., flood wall section, U. S. Engineers, to Joseph T. Ryerson & Son, Inc., Chicago.
 430 Tons, New York, Pelham Parkway, contract 87, to Concrete Steel Co., New York.
 315 Tons, Fall River, Mass., housing project, to Concrete Steel Co., Boston; M. Spinelli, Boston, contractor.
 200 Tons, Hudson River Parkway, contract 87, to Concrete Steel Co., New York, Pertracco & Banko, contractors.
 161 Tons, Binghamton, N. Y., hospital power house, to Joseph T. Ryerson & Son, Inc., Chicago, through L. B. Strandberg & Son Co., Chicago.
 160 Tons, State of Pennsylvania, mesh for highway project, to Truscon Steel Co., Youngstown, through Koepke Construction Co.
 160 Tons, Binghamton, N. Y., flood wall, section 2, U. S. Engineers, to Jones & Laughlin Steel Corp., Pittsburgh, through Tuckahoe Construction Co., contractors.
 110 Tons, Washington County, Md., highway project W-182-1-634, to Bethlehem Steel Co., Bethlehem, Pa., through Bennett & Hunter, contractors.
 100 Tons, West Hartford, Conn., municipal filtration plant, to Bethlehem Steel Co., Bethlehem, Pa., through F. H. McGraw Co., contractor.
 100 Tons, Chester County, Pa., road, Hempt Brothers, general contractor, to Bethlehem Steel Co., Bethlehem, Pa.
 100 Tons, Bethlehem, Pa., Eugene G. Grace Hall, Lehigh University, to Bethlehem Steel Co., Bethlehem, Pa.

SOUTH AND CENTRAL

- 300 Tons, Texas City, Tex., extension for carbide & Carbon Chemical Corp., to Truscon Steel Co., Youngstown, Ohio.
 300 Tons, Blackhawk, Iowa, State highway project, to Missouri Rolling Mill Co., St. Louis.
 250 Tons, Huntington, W. Va., pumping stations (6), U. S. Engineers, to West Virginia Rail Co., Huntington, W. Va., through Norton & Nadalin, contractors.
 200 Tons, Freeport, Tex., Dow Chemical Co. expansion, to Truscon Steel Co., Youngstown, Ohio, through Austin Co., Cleveland.
 110 Tons, Sandusky, Ohio, relief sewers, Division C and D, to Builders Structural Steel Co., Cleveland, through Mike Fatol, contractor.

Prices of Finished Iron and Steel...

Steel prices on these pages are f.o.b. basing points (in cents per lb.) unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases freight absorbed to meet competition.

Basing Point ↓ Product													DELIVERED TO		
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	Detroit	New York	Phila- delphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled ¹	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	
Long ternes ²	3.80¢		3.80¢									4.55¢			
Wrought iron	4.75¢														
STRIP															
Hot rolled ³	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢		
Cold rolled ⁴	2.80¢	2.90¢		2.80¢			2.80¢	(Wor- cester =	3.00¢)				2.90¢		
Cooperage stock	2.20¢	2.20¢		2.20¢			2.20¢								
Commodity C-R	2.95¢			2.95¢			2.95¢	(Wor- cester =	3.35¢)				3.05¢		
TIN PLATE															
Standard cokes (Per 100-lb. base box)	\$5.00	\$5.00	\$5.00						\$5.10						
BLACK PLATE															
29 gage ⁵	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ (in)			
TERNES, M'FG															
Special coated (Per base box)	\$4.30		\$4.30						\$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel ⁶	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢					2.40¢	2.70¢			
Reinforcing (billet) ⁷	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.25¢	2.25¢	2.25¢		
Reinforcing (rail) ⁷	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢				2.15¢	2.15¢	2.15¢		
Cold finished ⁸	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢							3.70¢		
PLATES										(Coatesville and Claymont = 2.10¢)					
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢			2.45¢	2.65¢		2.29¢	2.15¢
Wrought iron	3.80¢														
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢		(Bethlehem = 2.10¢)			2.45¢	2.75¢		2.27¢	2.215¢
SPRING STEEL C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢				(Wor- cester = 3.00¢)							
0.51 to 0.75 Carbon	4.30¢			4.30¢				(Wor- cester = 4.50¢)							
0.76 to 1.00 Carbon	6.15¢			6.15¢				(Wor- cester = 6.35¢)							
1.01 to 1.25 Carbon	8.35¢			8.35¢				(Wor- cester = 8.55¢)							
WIRE⁹															
Bright	2.60¢	2.60¢		2.60¢	2.60¢										
Galvanized	2.60¢	2.60¢		2.60¢	2.60¢										
Spring	3.20¢	3.20¢		3.20¢	3.20¢										
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢					2.85¢	2.95¢			
IRON BARS															
Common		2.25¢			(Terra Haute, Ind. = 2.15¢)										
Refined	3.75¢														
Wrought	4.40¢														

¹ Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. ² Unassorted 8-lb. coating. ³ Widths up to 12 in. ⁴ Carbon 0.25 per cent and less. ⁵ Applies to 29 gage within certain width and length limitations. ⁶ For merchant trade. ⁷ Straight lengths as quoted by distributors. ⁸ Also shafting. For quantities of 20,000 to 39,999 lb. ⁹ Carload lots to manufacturing trade. ¹⁰ Boxed.

PRICES

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Re-rolling only). Prices delivered Detroit are \$2 higher f.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton

Re-rolling \$34.00
Forging quality 40.00

Shell Steel

Basic open hearth shell steel f.o.b. Pittsburgh and Chicago.

Per Gross Ton

3 in. to 8 in. \$54.00
8 in. to 12 in. 52.00
12 in. to 18 in. 54.00
18 in. and over. 56.00

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting to length, or quantity. This type of steel is for hot rolled sections used for the making of shells and includes rounds, round squares, and special sections.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open hearth or bessemer \$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved, universal and sheared. 1.90c.

Wire Rods

(No. 5 to 9/32 in.)

Per Lb.

Pittsburgh, Chicago, Cleveland 2.00c.
Worcester, Mass. 2.10c.
Birmingham 2.00c.
San Francisco 2.50c.
Galveston 2.25c.

9/32 in. to 47/64 in., \$3 a net ton higher. Quantity extras apply.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh; Package, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	\$6.00	\$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00
25-lb. coating I.C.	8.00	16.00
30-lb. coating I.C.	8.63	17.25
40-lb. coating I.C.	9.75	19.50

WIRE PRODUCTS

(To the Trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham)

Base per Keg

Standard wire nails \$2.55
Coated nails 2.55
Cut nails, carloads 3.85

Base per 100 Lb.

Annealed fence wire \$3.05

Base Column

Woven wire fence* 67
Fence posts (carloads) 69
Single loop bale ties 56
Galvanized barbed wire† 70
Twisted barbless wire 70

*15½ gage and heavier. †On 80-rod spools in carload quantities.
Note: Birmingham base same on above items, except spring wire.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:
½ in. and 6 in. and smaller 68½
Larger and longer up to 1 in. 66
1½ in. and larger 64
Lag bolts 66

Plow bolts, Nos. 1, 2, 3, and 7 68½
Hot pressed nuts; c.p.c., t-nuts; square, hex., blank or tapped:
½ in. and smaller 67
9/16 in. to 1 in. inclusive 64
1½ in. to 1½ in. inclusive 62
1½ in. and larger 60

On above items, excepting plow bolts, additional allowance of 10 per cent for full container quantities.

On all of the above items there is an additional 5 per cent allowance for car-load shipments.

Semi-fin. hexagon nuts	U.S.S.	S.A.E.
½ in. and smaller 67	70	
9/16 to 1 in. 64	65	
1½ in. through 1½ in. 62	62	
1½ in. and larger 60	60	

In full container lots, 10 per cent additional discount.

Stove bolts, packages, nuts loose 72½

Stove bolts in packages, with nuts attached, add 15% extra.

Stove bolts in bulk 83½

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York, lots of 200 lb. or over.

Large Rivets

(½ in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham \$3.40

Small Rivets

(7/16 in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 65 and 10

Cap and Set Screws

Per Cent Off List

Milled hexagon head, cap screws, 1 in. dia. and smaller 50 and 10
Milled headless set screws, cut thread ¼ in. and larger 64
3/16 in. and smaller 73
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller 70
Upset set screws, cup and oval points 75
Milled studs 52

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

NON-FERROUS PRICES

Cents per lb. for early delivery

	July 10	July 11	July 12	July 13	July 15	July 16
Copper, Electrolytic¹	11.50	11.50	11.50	11.50	11.50	11.50
Copper, Lake	11.50	11.50	11.50	11.50	11.50	11.50
Tin, Straits, New York	51.25	51.25	51.25	....	51.25	51.25
Zinc, East St. Louis²	6.25	6.25	6.25	6.25	6.25	6.25
Lead, St. Louis³	4.85	4.85	4.85	4.85	4.85	4.85

¹ Mine producers' quotations only, delivered Conn. Valley. Deduct ¼c. for approximate New York delivery price. ² Add 0.39c. for New York delivery. ³ Add 0.15c. for New York delivery.

Warehouse Products

Cents per lb., Delivered

	New York	Cleveland
Tin		
Straits pig	52.50	56.50
Copper		
Lake	13.25	12.625
Electro	12.75	12.625
Castings	12.375	12.375
H. R. sheets*	20.12	20.12
Seamless tubes*	20.62	20.62
Brass		
Yellow, sheets*	18.56	18.56
Yellow, rods*	13.55	13.55
Seamless tubes*	21.31	21.31
Zinc		
Slabs	7.60	7.75
Sheets, No. 9 casks..	12.00	12.00
Lead		
American pig	6.10	5.50
Bar	8.05	8.25
Cut sheets	8.25	8.25
Antimony		
Asiatic	16.00	17.00
Aluminum		
Virgin, 99%	20.50	21.50
No. 1 remelt., 98-99%	18.00	18.50
Solder		
½ and ½	31.75	32.50
Babbitt		
Anti-friction grade..	22.25	22.00

Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper		
Hvy. crucible ...	8.625	9.25
Hvy. and wire...	7.625	8.00
Light and bottoms	6.625	7.125
Brass		
Heavy	4.875	5.375
Light	3.625	4.375
No. 1 yel. turn...	4.50	5.50
No. 1 red or compo. turn	7.375	7.875
Hvy. Mach. compo.	7.625	8.25
Lead		
Heavy	4.00	4.375
Aluminum		
Cast	8.50	9.50
Sheet	13.50	14.50
Zinc	3.25	4.00

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered: virgin, 99 per cent plus, 19c.-20c. a lb.; No. 12 remelt No. 2 standard, 18c.-19c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt: Asiatic, 16.50c. a lb., New York; American, 13c. a lb., f.o.b. smelter. QUICK-SILVER, \$200 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 12c. a lb.

*These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33½; on brass sheets and rods, 40; on brass tubes, 33½, and copper tubes, 40.

PRICES

ALLOY STEEL

Alloy Steel Blooms, Billets and Slabs

Base per gross ton, f.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem.....\$54.00

Alloy Steel Bars

Base per pound, f.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade 2.70c.
Delivered, Detroit 2.80c.

S.A.E. Series Numbers	Alloy Differential, per 100 Lb.
2000 (1.5 Ni)	\$0.35

2100 (1.5 Ni)	0.75
2300 (3.5 Ni)	1.55
2500 (5 Ni)	2.25
3100 Ni-Cr	0.70
3200 Ni-Cr	1.35
3300 Ni-Cr	3.80
3400 Ni-Cr	3.20
4100 Cr-Mo (0.15 to 0.25 Mo.)..	0.55
4100 Cr-Mo (0.25 to 0.40 Mo.)..	0.75
x4340 Cr-Ni-Mo	1.65
4340 Cr-Ni-Mo	1.85
4600 Ni-Mo (0.2-0.3 Mo, 1.5-2 Ni)	1.10
5100 (0.60-0.90 Cr)	0.35
5100 (0.80-1.10 Cr)	0.45
5100 Cr spring steel	0.15
52-100 Cr. (electric furnace)....	2.60
6100 Cr-V bar	1.20

6100 Cr-V spring steel	0.85
Cr-Ni-V	1.50
C-V	0.85

The above differentials are for hot rolled finished products. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

Base per pound, f.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.35c. Delivered Detroit, 3.45c., carlots.

STAINLESS AND HEAT-RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chromium-Nickel

No.	304	302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium

No.	410	430	442	446
Bars ..	18.50c.	19.00c.	22.50c.	27.50c.
Plates ..	21.50c.	22.00c.	25.50c.	30.50c.
Sheets ..	26.50c.	29.00c.	32.50c.	36.50c.
H'tstrip ..	17.00c.	17.50c.	24.00c.	35.00c.
C'ld st. ..	22.00c.	22.50c.	32.00c.	52.00c.

TOOL STEEL

(F.o.b. Pittsburgh)

Base per Lb.

High speed	67c.
High-carbon-chromium	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

ELECTRICAL SHEETS

(F.o.b. Pittsburgh)

Base per Lb.

Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

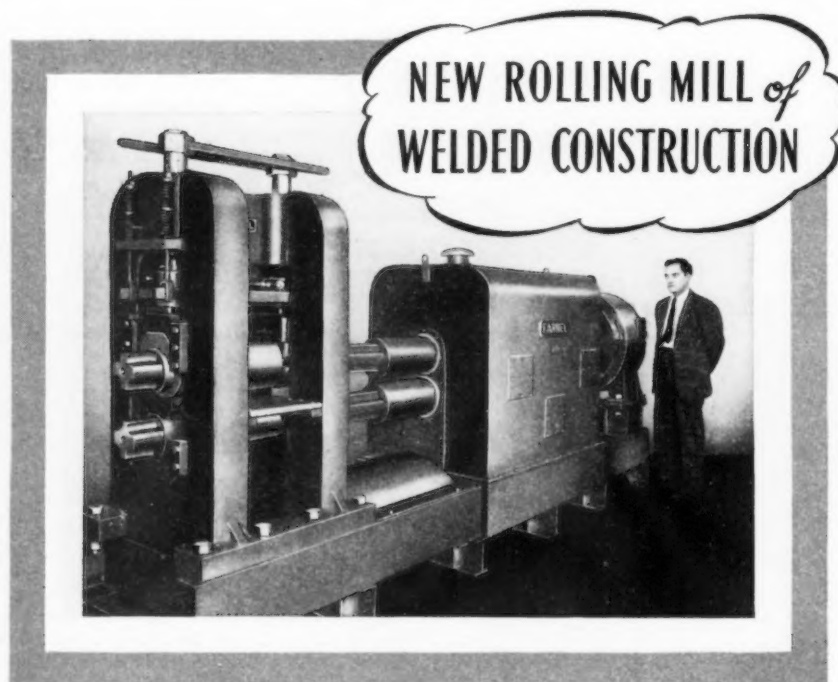
Silicon strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago..	\$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham..	46.00
6-in. and larger f.o.b. dock, San Francisco or Los Angeles or Seattle	56.00

Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$45 at Birmingham and \$53.80 delivered Chicago.



Built by FARREL for Purdue University

This rolling mill recently built for experimental work at Purdue University embodies some interesting features. It is of welded construction and is designed to perform either hot or cold rolling of metals.

It is an 8" x 12" two-high mill with the mill, reduction drive, pinion stand and motor mounted on a common bedplate to form an integral unit. The mill housings, drive case and bedplate are all fabricated from rolled steel plate and welded. Two pairs of interchangeable forged steel rolls are furnished, one pair of suitable composition and hardness for cold rolling and the other pair for hot rolling. The housings are of the arch-top type, welded together into a single structure.

On each housing, mounted between the top roll rider and adjusting screw, is a hydraulic cylinder or pressure block with a ram. The total separating force on each screw is recorded in pounds on a chart, and adding the separate readings gives the total separating force on the mill.

The mill is driven by a direct current, variable speed motor through an enclosed double reduction drive with integral pinion stand. The drive is the vertical type with all gear centers in the same plane. Gears and mill pinions are accurately generated Sykes continuous tooth herringbone and are mounted in anti-friction roller bearings. An oil pump with filter provides force-feed lubrication to all gears and bearings.

When you have a problem involving the rolling of metals take advantage of the experienced counsel and expert assistance Farrel engineers can give you. We are prepared to build mills of any size for rolling all kinds of non-ferrous metals and cold rolled strip steel.



FARREL-BIRMINGHAM COMPANY, Inc.
ANSONIA, CONN.

New York • Buffalo • Pittsburgh • Akron • Chicago • Los Angeles

PRICES

BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall.

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

	Seamless	Lap Weld,
	Cold Drawn	Hot Rolled
1 in. o.d. 13 B.W.G.	\$9.01	\$7.82
1 1/4 in. o.d. 13 B.W.G.	10.67	9.26
1 1/2 in. o.d. 13 B.W.G.	11.70	10.23
1 3/4 in. o.d. 13 B.W.G.	13.42	11.64
2 in. o.d. 13 B.W.G.	15.03	13.04
2 1/4 in. o.d. 13 B.W.G.	16.76	14.54
2 1/2 in. o.d. 12 B.W.G.	18.45	16.01
2 3/4 in. o.d. 12 B.W.G.	20.21	17.54
3 in. o.d. 12 B.W.G.	21.42	18.59
3 1/2 in. o.d. 11 B.W.G.	22.48	19.50
4 in. o.d. 11 B.W.G.	23.37	20.42
4 1/2 in. o.d. 10 B.W.G.	24.62	21.15
5 in. o.d. 9 B.W.G.	25.20	21.66
5 1/2 in. o.d. 9 B.W.G.	28.37	24.62
6 in. o.d. 7 B.W.G.	30.54	26.66
6 1/2 in. o.d. 7 B.W.G.	43.04	37.35
7 in. o.d. 7 B.W.G.	54.01	46.87
8 in. o.d. 7 B.W.G.	82.93	71.96

Extras for less carload quantities:

40,000 lb. or ft. over.....	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought iron pipe)

Base Price=\$200 Per Net Ton

Butt Weld

Steel	Black	Galv.
1/8 in.	56	36
1/4 to 3/8 in.	59	43 1/2
1/2 in.	63 1/2	54
3/4 in.	66 1/2	58
1 to 3 in.	68 1/2	60 1/2

Wrought Iron

	Black	Galv.
1/4 and 3/8 in.	+9	+30
1/2 in.	24	6 1/2
3/4 in.	30	13
1 and 1 1/4 in.	34	19
1 1/2 in.	38	21 1/2
2 in.	37 1/2	21

Lap Weld

Steel	Black	Galv.
2 in.	61	52 1/2
2 1/2 and 3 in.	64	55 1/2
3 1/2 to 6 in.	66	57 1/4
7 and 8 in.	65	55 1/2
9 and 10 in.	64 1/2	55
11 and 12 in.	63 1/2	54

Wrought Iron

2 in.	30 1/2	15
2 1/2 to 3 1/2 in.	31 1/2	17 1/2
4 in.	33 1/2	21
4 1/2 to 8 in.	32 1/2	20
9 to 12 in.	28 1/2	15

Butt weld, extra strong, plain ends

Steel	Black	Galv.
1/8 in.	54 1/2	41 1/2
1/4 to 3/8 in.	56 1/2	45 1/2
1/2 in.	61 1/2	53 1/2
3/4 in.	65 1/2	57 1/2
1 to 3 in.	67	60

Wrought Iron

1/4 and 3/8 in.	+10	+43
1/2 in.	25	9
3/4 in.	31	15
1 to 2 in.	38	22 1/2

Lap weld, extra strong, plain ends

Steel	Black	Galv.
2 in.	59	51 1/2
2 1/2 and 3 in.	63	55 1/2
3 1/2 to 6 in.	66 1/2	59

	Black	Galv.
7 and 8 in.	65 1/2	56
9 and 10 in.	64 1/2	55
11 and 12 in.	63 1/2	54

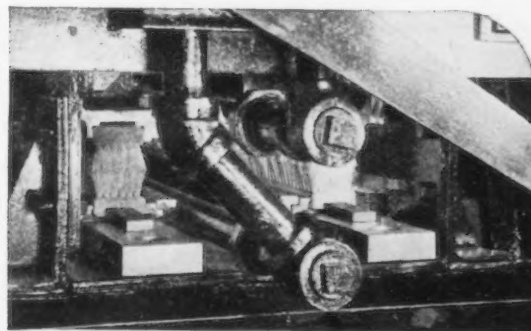
Wrought Iron

2 in.	33 1/2	18 1/2
2 1/2 to 4 in.	39 1/2	25 1/2
4 1/2 to 6 in.	37 1/2	24
7 and 8 in.	38 1/2	24 1/2
9 to 12 in.	32	20 1/2

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher, on all butt weld 8 in. and smaller.

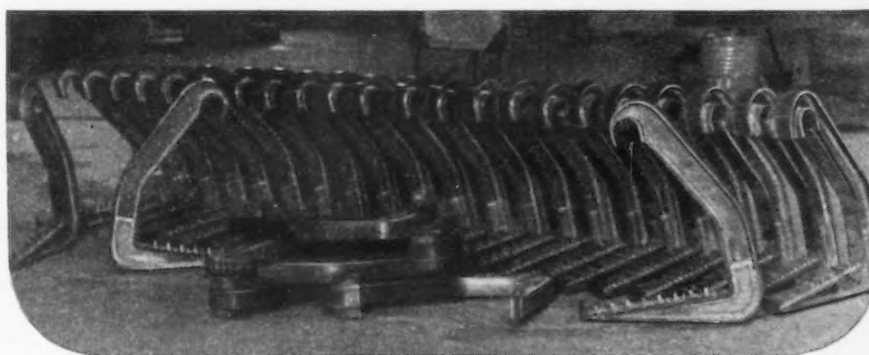
HOOK UP WITH LOWER COSTS!



Ability to stand up against pickling acids and heavy loads gives Monel equipment long life

Spotted just before wind up reels, six of these 48" Broden scrubbing machines, as shown above, scour

The pickling hooks pictured below were produced by the Youngstown Welding and Engineering Co. to carry 800 lb. loads. The upper portion of these hooks are plain steel. Lower portions, subjected to notch stress and acid baths, are long-lived Monel. Years have proved Monel



away every trace of acid and scum in a stainless steel wire mill out in Ohio. This photo also shows removable brushes held firmly in Monel holders. Monel withstands vibration and fatigue strains as easily as it resists corrosives. For longer wear, Broden uses Monel pins in the swinging arms.

provides high resistance to acids and other corrosives. Fabricating easily, Monel works in harmony with other metals.

Your consultation is invited on applications of various types of Monel. Please address:

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York, N. Y.



"Monel" is a registered trade-mark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper.

MONEL

PRICES

ORES

Lake Superior Ores

Delivered Lower Lake Ports

	<i>Per Gross Ton</i>
Old range, bessemer, 51.50% ..	\$4.75
Old range, non-bessemer, 51.50% ..	4.60
Mesaba, bessemer, 51.50% ..	4.60
Mesaba, non-bessemer, 51.50% ..	4.45
High phosphorus, 51.50% ..	4.35

Foreign Ores*

C.A.f. Philadelphia or Baltimore, Exclusive of Duty

	<i>Per Unit</i>
Algerian, low P, Cu free, dry, 55 to 58% Fe ..	12c.

Caucasian, washed, 52% Mn.	60c.
African, Indian, 44 to 48% Mn.	50c.
African, Indian, 49 to 51% Mn.	55c.
Brazilian, 46 to 48% Mn.	53c.
Cuban, del'd, duty free, 51% Mn.	72c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered.	\$23.50
Tungsten, domestic scheelite, delivered.	23.50
Chrome ore, lump c.i.f. Atlantic Seaboard, per gross ton:	
South African (low grade) ...	Nom.
Rhodesian, 45% ..	\$23.50
Rhodesian, 48% ..	27.50

RAILS, TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., gross ton ..	\$40.00
Angle bars, 100 lb.	2.70
<i>F.o.b. Basing Points</i>	
Light rails (from billets), gross ton ..	\$40.00
Light rails (from rail steel), gross ton ..	39.00
<i>Base per Lb.</i>	
Cut spikes ..	3.00c.
Screw spikes ..	4.55c.
Tie plates, steel ..	2.15c.
Tie plates, Pacific Coast.	2.30c.
Track bolts, steam railroads ...	4.15c.
Track bolts, discount to jobbers all sizes (per 100 counts) ...	65-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneapqua, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond, Va.

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail.	\$20.00
Domestic, f.o.b. Ohio River landing barges ..	20.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines.	21.00
Foreign, 85% calcium fluoride, not over 5% Si., c.i.f. Atlantic ports, duty paid.	\$25.00 to \$25.50
Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines.	\$31.00
As above, in bags, f.o.b. same mines ..	\$32.60

REFRACTORIES

Fire Clay Brick

Per 1000 f.o.b. Works

Super-duty brick, at St. Louis.	\$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois ..	47.50
First quality, New Jersey.	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois.	42.75
Second quality, New Jersey.	49.00
No. 1 Ohio ..	39.90
Ground fire clay, per ton.	7.10

Silica Brick

Pennsylvania ..	\$47.50
Chicago District ..	55.10
Birmingham ..	47.50
Silica cement, net ton (Eastern) ..	8.55

Chrome Brick

Net per Ton

Standard f.o.b. Baltimore, Plymouth Meeting and Chester.	\$50.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	50.00

Magnesite Brick

Standard f.o.b. Baltimore and Chester ..	\$72.00
Chemically bonded, f.o.b. Baltimore ..	61.00

Grain Magnesite

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks) ..	(—)*
Domestic, f.o.b. Baltimore and Chester in sacks ..	\$40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk) ..	22.00

*None available.

How, and where, FORGINGS are being used

*Over 300 Applications
of Forgings have been
described in "Drop
Forging Topics"*

Articles contain solutions of engineering problems, design information, steel and heat treating specifications; economies, and "quality advantages" obtained by users of forgings. Every issue of "Drop Forging Topics" offers evidence of actual results realized by manufacturers of a wide variety of types of equipment.

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DROP FORGING ASSOCIATION

605 HANNA BUILDING • CLEVELAND, OHIO



PRICES

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton
Domestic, 80% (carload).....\$120.00

Spiegeleisen

Per Gross Ton Furnace
Domestic, 19 to 21%.....\$36.00
Domestic, 26 to 28%..... 49.50

Electric Ferrosilicon

Per Gross Ton, Delivered, Lump Size
50% (carload lots, bulk).....\$74.50*
50% (ton lots, packed)..... 87.00*
75% (carload lots, bulk).....135.00*
75% (ton lots, packed).....151.00*

Bessemer Ferrosilicon

Per Gross Ton, F.o.b. Jackson, Ohio
10.00 to 10.50%.....\$33.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton, F.o.b. Jackson, Ohio
5.00 to 5.50%.....\$27.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon.....11.00c.
2% carbon17.50c.
1% carbon18.50c.
0.10% carbon20.50c.
0.06% carbon21.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

Silico-Manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon\$113.00*
2.50% carbon 118.00*
2% carbon 123.00*
1% carbon 133.00*

Other Ferroalloys

Ferrotungsten, per lb. contained W, del. carload..... \$2.00
Ferrotungsten, 100 lb. and less 2.25
Ferrovanadium, contract, per lb. contained V., del'd \$2.70 to \$2.90†
Ferracolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., ton lots\$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace, carload and contract, per net ton.....\$142.50

*Spot prices are \$5 per ton higher.
†Spot prices are 10c. per lb. of contained element higher.

Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton.....\$157.50

Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton\$58.50

Ferrophosphorus, electrolytic 23-26% in carlots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville\$75.00

Ferromolybdenum, per lb. Mo, f.o.b. furnace..... 95c.
Calcium molybdate, per lb. Mo, f.o.b. furnace 80c.
Molybdenum oxide briquettes 48-52% Mo, per lb. contained Mo, f.o.b. Langeloth, Pa. 80c.

FUEL OIL

Per Gal.
No. 3, f.o.b. Bayonne, N. J.....4.75c.
No. 6, f.o.b. Bayonne, N. J.....3.21c.
No. 5 Bur. Stds., del'd Chicago..3.25c.
No. 6 Bur. Stds., del'd Chicago..2.75c.
No. 3 distillate, del'd Cleveland..5.25c.
No. 4 industrial, del'd Cleveland..5.00c.
No. 5 industrial, del'd Cleveland..3.75c.
No. 6 industrial, del'd Cleveland..3.25c.

DOALL MAKES DIES FOR CERAMICS IN 1/10th FORMER TIME

Photograph shows ceramic parts, some as small as 1/16" sent us by Sutpakoff Laboratories of Pittsburgh. They write: "We are pleased to mail you ceramic samples. Note these are miniature parts. Dies are made of Mangana Steel and our DoAll 'walks right through' the most complex design in from 1/4 to 1/10 the usual time. The DoAll is one of our most versatile and time saving machines."



FASTEST METHOD TO CUT ALL METALS



The DoAll is a moderately priced, rugged precision machine tool that replaces shaping, milling and lathe work with enormous savings of time, labor and material. Cuts out internal and external shapes from any metal up to 10" thick.

Used in large and small plants in 30 countries by manufacturers of all kinds of metal goods, machine parts, dies and tools, appliances, equipment, motor cars, airplanes; also by ship builders, railroads, arsenals, etc.



Let a factory trained man bring a DoAll to your plant and show you what it does, what it saves on your own work.

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PRICES

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, prompt	\$4.25 to \$4.50
Foundry, f.o.b. Connellsville, prompt	\$5.25 to 5.50
F'dry, by-product, Chicago....	10.50
F'dry, by-product, New England	12.50
Foundry, by-product, Newark or Jersey City	\$11.30 to \$11.90
F'dry, by-product, Philadelphia	11.13
F'dry, by-product, Cleveland...	11.05
F'dry, by-product, Cincinnati..	10.50
Foundry, Birmingham	7.50
F'dry, by-product, St. Louis	
	\$10.75 to \$11.00
Foundry, from Birmingham, f.o.b. cars dock Pacific ports.....	\$14.75

BRITISH

British

Per Gross Ton, f.o.b. United Kingdom Ports

Ferromanganese, export. £17 18s.
Tin plate, per base box 32s. to 33s.
Steel bars, open hearth £13 9s.
Beams, open hearth.... £12 2s. 6d.
Channels, open hearth.. £12 2s. 6d.
Angles, open hearth.... £12 2s. 6d.
Black sheets, No. 24 gage
£18 17s. 6d. max.*; £18 17s. 6d. min.**
Galvanized sheets, No. 24
gage £19 10s. max.*; £19 10s. min.**

*Empire markets only.

**Other than Empire markets.

PIG IRON (Per Gross Ton)

Prices delivered various consuming points indicated by bold italics

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phos.
Boston	\$24.50	\$24.00	\$25.50	\$25.00	.....
Brooklyn	26.50	.....	.....	27.00	.....
Jersey City	25.53	25.03	26.53	26.03	.....
Philadelphia	24.84	24.34	25.84	25.34	.....
Bethlehem, Pa.	\$24.00	\$23.50	\$25.00	\$24.50	.....
Everett, Mass.	24.00	23.50	25.00	24.50	.....
Swedeland, Pa.	24.00	23.50	25.00	24.50	.....
Steelton, Pa. ....	.....	23.50	.....	.....	28.50
Birdsboro, Pa.	24.00	23.50	25.00	24.50	28.50
Sparrows Point, Md.	24.00	23.50	.....	.....	.....
Erie, Pa.	23.00	22.50	24.00	23.50	.....
Neville Island, Pa.	23.00	22.50	23.50	23.00	.....
Sharpsville, Pa.	23.00	22.50	23.50	23.00	.....
Buffalo	23.00	22.00	24.00	23.50	28.50
Cincinnati	23.44	23.61	.....	24.11	.....
Canton, Ohio	24.39	23.89	24.89	24.39	.....
Mansfield, Ohio	24.94	24.44	25.44	24.94	.....
St. Louis	23.50	23.02	.....	.....	.....
Chicago	23.00	22.50	23.50	23.00	.....
Granite City, Ill.	23.00	22.50	23.50	23.00	.....
Cleveland	23.00	22.50	23.50	23.00	.....
Hamilton, Ohio	23.00	22.50	.....	23.00	.....
Toledo	23.00	22.50	23.50	23.00	.....
Youngstown	23.00	22.50	23.50	23.00	.....
Detroit	23.00	22.50	23.50	23.00	.....
St. Paul	25.63	.....	26.13	25.63	.....
Duluth	23.50	.....	24.00	23.50	.....
Birmingham	19.38*	18.00	24.00	.....	.....
Los Angeles, San Francisco and Seattle....	27.50	.....	.....	.....	.....
Provo, Utah	22.00	.....	.....	.....	.....
Montreal†	27.50	27.50	28.00
Toronto†	25.50	25.50	26.00

GRAY FORGE

Valley or Pittsburgh fce.....\$22.50

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Base prices are subject to an additional charge for delivery within the switching limits of the respective districts.

*Delivered prices on Southern iron for shipment to Northern points are 38c. a ton below delivered prices from nearest Northern basing point on iron with phosphorus content of 0.70 per cent and over. †On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

WAREHOUSE PRICES

(Base Prices, Dollars per 100 lb., Delivered Metropolitan Areas)

	Pitts- burgh	Chicago	Cleve- land	Phila- delphia	New York	Detroit	Buffalo	Boston	Birm- ingham	St. Louis	St. Paul	Mil- waukee	Los Angeles
Sheets, hot rolled	\$3.15	\$3.05	\$3.15	\$3.35	\$3.38	\$3.23	\$3.05	\$3.51	\$3.45	\$3.18	\$3.30	\$3.48	\$4.10
Sheets, cold rolled .....	.....	4.10	4.05	4.05	4.40	4.30	4.30	4.58	.....	4.12	4.35	4.43	6.30
Sheets, galvanized	4.75	4.60	4.42	4.50	4.30	4.64	4.45	4.66	4.75	4.95	4.75	4.98	5.25
Strip, hot rolled	3.40	3.40	3.30	3.75	3.76	3.48*	3.62	3.86	3.70	3.52	3.65	3.73	.....
Strip, cold rolled	3.20	3.30	3.20	3.31	3.31	3.20	3.22	3.26	.....	3.41	3.83	3.54	.....
Plates	3.40	3.55	3.40	3.55	3.76	3.60	3.62	3.85	3.35	3.47	3.80	3.68	4.00
Structural shapes	3.40	3.55	3.58	3.55	3.75	3.65	3.40	3.85	3.55	3.47	3.80	3.68	4.00
Bars, hot rolled	3.35	3.50	3.25	3.85	3.84	3.43	3.35	3.98	3.50	3.62	3.75	3.63	4.15
Bars, cold finished	3.65	3.75	3.75	4.06	4.09	3.80	3.75	4.13	4.43	4.02	4.34	3.88	6.60
Bars, ht. rld. SAE 2300.	7.20	7.10	7.30	7.31	7.35	7.42	7.10	7.50	.....	7.47	7.45	7.33	9.40
Bars, ht. rld. SAE 3100.	5.75	5.65	5.85	5.86	5.90	5.97	5.65	6.05	.....	6.02	6.00	5.88	8.55
Bars, cd. drn. SAE 2300.	8.15	8.15	8.15	8.56	8.59	8.45	8.15	8.63	.....	8.52	8.84	8.38	10.65
Bars, cd. drn. SAE 3100.	6.75	6.75	6.75	7.16	7.19	7.05	6.75	7.23	.....	7.12	7.44	6.98	9.80

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb.; galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: Chicago, galvanized sheets, 500 to 1499 lb.; Philadelphia, galvanized sheets, one to nine bundles, cold rolled sheets, 1000 to 1999 lb.; Detroit, galvanized sheets, 500 to 1499 lb.; Buffalo, cold rolled sheets, 500 to 1500 lb.; galvanized sheets, 450 to 1499 lb.; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; Birmingham, hot rolled sheets, strip and bars, plates and shapes, 400 to 3999 lb.; galvanized sheets, 500 to 1499 lb.; St. Louis, cold rolled sheets, 400 to 1499 lb.; galvanized sheets, 500 to 1499 lb.; Milwaukee, cold rolled sheets, 400 to 1499 lb.; galvanized sheets, 150 to 499 lb.; New York, hot rolled sheets, 0 to 1999 lb.; cold rolled sheets, 400 to 1499 lb.; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, shapes, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 150 to 1049 lb. Extras for size, quality, etc., apply on above quotations. *12 gage and heavier, \$3.23.

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North Atlantic

● **Bell Telephone Laboratories, Inc.**, 463 West Street, New York, has filed plans for new plant on Mountain Avenue, New Providence Township, N. J., consisting of one and multi-story structures, power station, machine shop and auxiliary buildings. Cost close to \$2,000,000 with equipment.

● **Continental Can Co.**, 100 East Forty-second Street, New York, has let general contract to Austin Co., Cleveland, for new branch plant at Walla Walla, Wash., comprising two main one-story structures for general manufacture and storage and distribution, respectively, and auxiliary buildings, power house and other mechanical units, totaling about 125,000 sq. ft. of floor space. Cost close to \$500,000 with equipment.

● **Signal Corps Procurement District**, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until July 22 for 191,000 ft. of cable and 60 reels (Circular 4).

● **Electro Metallurgical Co.**, 30 East Forty-second Street, New York, metals, ferroalloys, etc., plans new one-story branch plant, 75 x 220 ft., at Colbert, Ala., with auxiliary units. Cost over \$150,000 with equipment.

● **A. J. Thalman**, 193 West Farms Road, New York, contractors' machinery and equipment, has filed plans for one-story machine shop, 30 x 106 ft., at Boston Road and Edson Avenue. Cost close to \$40,000 with equipment.

● **Constructing Quartermaster**, Mitchell Field, L. I., New York, plans extensions in steam power plant, including additional equipment. Cost about \$57,000.

● **Aviation Institute of New York**, 24-13 Bridge Plaza North, Long Island City, has leased three-story building, 75 x 200 ft., and several one-story adjoining structures on site 200 x 240 ft., at Thirty-fifth Avenue, extending from Thirty-sixth to Thirty-seventh Streets, for expansion in school for instruction in airplanes, engines and aircraft sheet metal courses.

● **Commanding Officer**, Ordnance Department, Watervliet Arsenal, Watervliet, N. Y., asks bids until July 22 for forgings and castings for 290 90-mm. guns (Circular 776).

● **Pollak Mfg. Co.**, 541 Devon Street, Arlington, N. J., tools, dies, etc., has purchased four-story building at 528-34 Elm Street, Kearny, N. J., and will improve for plant.

● **Bayonne Steel Barrel Co.**, Constable Hook, Bayonne, N. J., has let general contract to John H. French Co., 110 East Forty-second Street, New York, for one-story addition, 70 x 175 ft. Cost over \$40,000 with equipment.

● **Carter Products, Inc.**, 300 Communipaw Avenue, Jersey City, N. J., drug and pharmaceutical products, has acquired about 18 acres in North Brunswick Township, for new one-story plant, about 100,000 sq. ft. of floor space, and auxiliary structures and shops. Cost close to \$500,000 with equipment.

● **American Viscose Corp.**, Delaware Trust Building, Wilmington, Del., viscose rayon products, plans modernization and expansion in main mill at Marcus Hook, Pa., with new machinery to replace obsolete equipment. Cost about \$1,000,000, majority of fund to be used for machinery purchases.

● **Bureau of Yards and Docks**, Navy Department, Washington, plans expansion and improvements in Philadelphia Navy Yard, for which a gross appropriation of about \$15,200,000 has been authorized for fiscal year, including new one-story shipfitters' shop, about \$300,000 with equipment; electric equipment shop, \$255,000; extension of low cranes at head of shipway No. 3, modification and improvements in such shipways for 45,000-ton battleships, and replacing of present 40-ton shipway cranes with 50-ton units, \$1,250,000; new shipbuilding dock No. 3 to accommodate 45,000-ton battleship, \$10,000,000; extensions

and improvements in power plant, with additional equipment, \$895,000; improvements in crane tracks and extension of turret construction slab, \$120,000; additional crane pier No. 2, \$125,000; additional weight-handling equipment, \$215,000.

Buffalo District

● **Daystrom Corp.**, Brown and Franklin Streets, Olean, N. Y., metal stampings, etc., has let general contract to F. T. Coughlin, 230 North Third Street, for one-story addition, 120 x 160 ft. Cost over \$65,000 with equipment.

● **Chevrolet Motor & Axle Division**, River Road, Tonawanda, N. Y., will make improvements and replacements in equipment, including retooling in main production department. Plant is being closed down for this purpose, to resume operations early in August. Alfred G. Gulliver is general manager.

● **J. P. Danielson Co., Inc.**, Allen Street, Jamestown, N. Y., wrenches and kindred tools, plans one-story addition. Cost close to \$50,000 with equipment.

New England

● **American Brass Co.**, West Main Street, Waterbury, Conn., has approved plans for one-story addition, 80 x 200 ft., at South plant, and one-story extension, 62 x 85 ft., at North plant. Cost over \$80,000 with equipment.

● **Van Norman Machine Tool Co.**, Springfield, Mass., milling machines, grinders, etc., has begun removal of automotive products division to local plant of Metal Saw & Machine Co., recently acquired, which will be used exclusively for such branch of production. Present capacity will be increased. Company has disposed of band saw department of acquired company to L. S. Starrett Co., Athol, Mass., which will consolidate and operate as part of organization.

● **Bureau of Yards and Docks**, Navy Department, Washington, plans new shops and other buildings at submarine base, New London, Conn., with equipment for increased capacity. Total appropriation of \$3,073,000 has been arranged for work during fiscal year. Project will begin soon.

● **Public Works Officer**, Navy Yard, Boston, asks bids (no closing date stated) for galley equipment, with steam boiler, piping, etc., at Naval aviation station, Squantum, Mass. (Specifications 9914).

Washington District

● **General Purchasing Officer**, Panama Canal, Washington, asks bids until July 23 for two gasoline motor wagon cranes (Schedule 4159), quantity of manhole frames and covers, belt conveyor brushes, brass globe valves and cable-way bucket (Schedule 4156); until July 24 for 36,000 lin. ft. of steel wire rope, four pressure and vacuum compound gages (Schedule 4161).

● **Norfolk Shipbuilding & Drydock Co.**, Norfolk, Va., plans two-story addition for storage and distribution. Cost close to \$40,000 with equipment. Alexander O. Ferebee, 716 Boush Street, is architect.

● **Constructing Quartermaster**, Edgewood Arsenal, Edgewood, Md., plans ammunition processing plant, ammunition loading plant and application plant. Appropriation of \$1,261,758 has been arranged in emergency budget for buildings and equipment. Another appropriation of \$310,000 has been approved for three one-story warehouses and equipment, hoisting machinery, magazines, concrete storage tank and other work.

● **Potomac Electric Power Co.**, Tenth and E Streets, N.W., Washington, has authorized

further expansion in steam-electric plant at Buzzard Point, where extensions are now in progress, including new 50,000-kw. turbine-generator unit and auxiliary equipment. Initial program is scheduled for completion next fall and remainder of work early in 1942. Company has arranged bond issue of \$10,000,000, majority of fund to be used for this and other extensions and improvements.

● **Bureau of Yards and Docks**, Navy Department, Washington, has appropriation of about \$875,000 for expansion and improvements in Navy yard at Bellevue, D. C., during fiscal year, including one-story addition to machine shop, \$375,000 with equipment; addition to buffing shop, \$100,000 with equipment; extensions in general utility shop, \$125,000; extensions and improvements in steam distributing system, \$75,000; extensions in pneumatic system, \$100,000; addition to oil storage building, \$50,000; and one-story equipment storage and distributing building, \$50,000.

● **Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until July 23 for 5000 galvanized steel barrels for inflammable liquids (Schedule 2262) for Eastern and Western Navy yards.

South Atlantic

● **Barbour Boat Works, Inc.**, New Bern, N. C., plans expansion and improvements in boat-building and repair works, including new shop unit and equipment. Cost close to \$40,000 with equipment.

● **United States Engineer Office**, Jacksonville, Fla., asks bids until Aug. 2 for construction and installation of machinery, electrical equipment, etc., of new control station at St. Lucie lock, St. Lucie canal, near Stuart, Fla.

● **Cartersville Coca-Cola Bottling Co.**, Cartersville, Ga., has approved plans for new two-story mechanical-bottling, storage and distributing plant, for which superstructure will begin at once. Cost close to \$45,000 with equipment.

South Central

● **Indian Refining Co.**, Circle Tower Building, Indianapolis, plans new bulk oil terminal at Owensboro, Ky., comprising several one-story buildings, steel tanks, pipe lines and other facilities. Cost over \$75,000 with equipment.

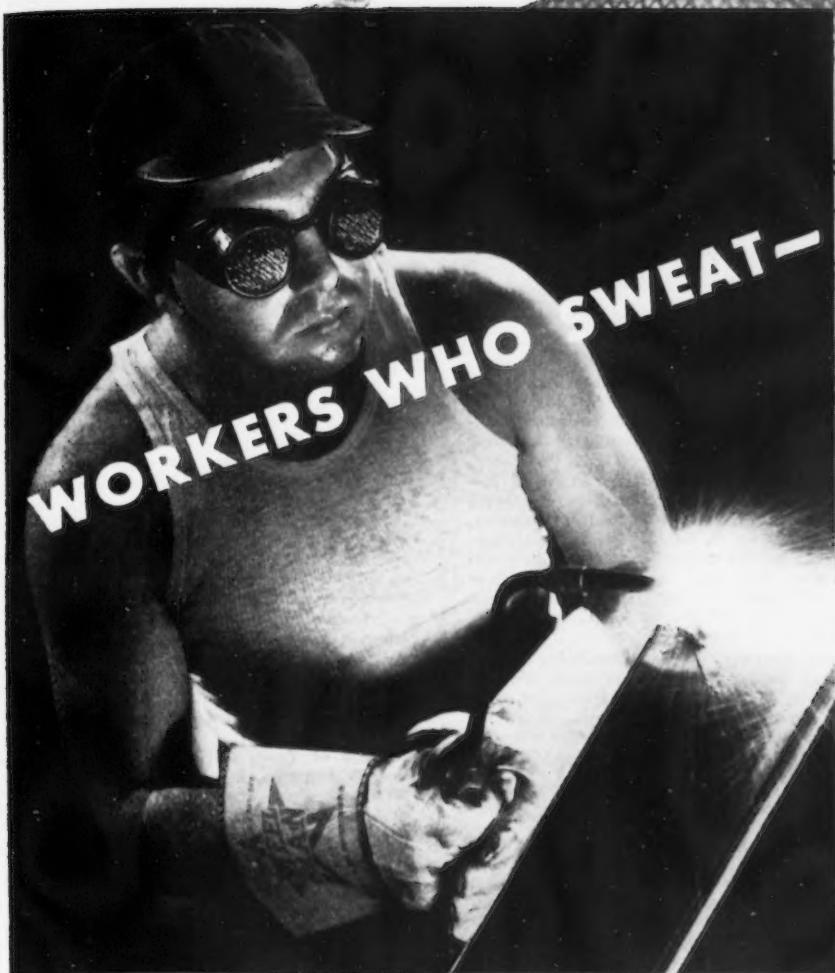
● **Manager, Municipal Airport**, Lovell Field, Chattanooga, Tenn., plans expansion and improvements, including five new steel hangars, with repair and reconditioning shops, administration building and other structures and facilities. Fund of about \$750,000 is being arranged for project. Aviation Committee, Chamber of Commerce, is interested in program.

● **Curtis Lighting, Inc.**, 1123 West Jackson Boulevard, Chicago, lighting fixtures, has arranged with Greater Paducah Association, Paducah, Ky., for branch plant at latter place. Organization will provide site and company will erect one-story building. Cost over \$50,000 with equipment.

● **One Hundred and Sixty Observatory Squadron**, Major H. L. Badham, in charge, Birmingham, care of I. E. Morris, Empire Building, consulting engineer, plans new steel hangar at municipal airfield, with facilities for 12 planes, including reconditioning and repair shop. Cost over \$100,000 with equipment.

Southwest

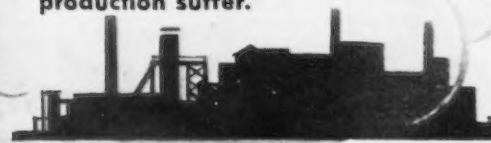
● **Porterfield Aircraft Corp.**, 2809 East Fourteenth Street, Kansas City, Mo., has leased one-story building at 1409-11 Kansas Avenue, for expansion. Equipment will be installed for



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Hot weather and heavy work rob men of vitally needed body salt. They tire quickly. Nervous energy is sapped. Efficiency and production suffer.



Why Take Chances In Your Plant?

Men doing hot, heavy work may sweat as much as two gallons in an 8-hour shift! Every drop of sweat carries off salt from the body. Unless that salt is replaced *immediately*, excessive fatigue follows. Lowered efficiency, sickness, and cramps may result. HEAT FAG takes its toll!

Guard against this hazard. Industry throughout America is finding Morton's Salt Tablets and Morton's Dispensers the effective, economical way to replace salt loss and prevent HEAT FAG.

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ing fountains, where workers can help themselves freely.

Morton's Salt Tablets are made of most highly refined salt, pressed into convenient 10-grain size. Easy to take with a drink of water . . . dissolve in less than 50 seconds after swallowing.

Write for folder, "Heat Fag Among Workers."



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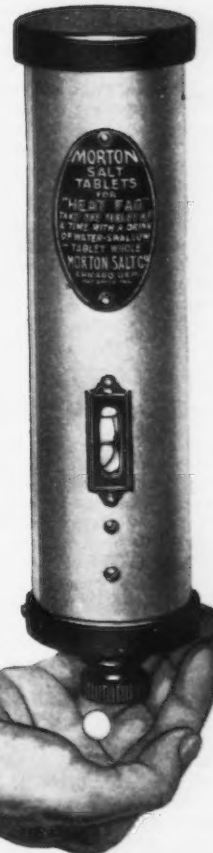
500-tablet capacity.....\$325
1000-tablet capacity.....\$400

TABLETS

Case of 9000 10-grain tablets....\$260

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MORTON SALT COMPANY • CHICAGO, ILLINOIS

production of airplane wings and other parts for small, all-metal, light-type aircraft. Harlow Aircraft Co., Alhambra, Cal., recently has acquired an interest in Porterfield company.

Williams Meat Co., 20 Kansas Avenue, Kansas City, Kan., meat packer, has asked bids on general contract for one and two-story U-shaped addition, 113 x 113 ft., with loading dock and other facilities. Cost over \$80,000 with equipment. Joseph W. Radotinsky, Commercial National Bank Building, is architect.

Coca-Cola Bottling Co., 2930 North Market Street, St. Louis, plans new one-story mechanical-bottling, storage and distributing plant, 100 x 125 ft., at Garrison Avenue and Benton Street. Cost close to \$60,000 with equipment. Preston J. Bradshaw, Inc., 718 Locust Street, is architect.

Public Works Department, Springfield, Mo., plans steel hangar, 100 x 120 ft., with reconditioning and repair shop, at municipal airport; also new administration building. Cost about \$75,000 with equipment. Johnson & Robinett, Landers Building, are associated architects.

Ideal Cement Co., Cement Building, Denver, plans expansion and improvements in former mill of Gulf Portland Cement Co., on ship channel, Houston, Tex., recently acquired, including new production units and equipment for close to double present capacity. Cost over \$200,000 with machinery.

Madaras Steel Corp., Longview, Tex., care of C. H. Grissom, Longview, president, plans new reduction plant at iron ore properties near Longview, with processing and mechanical-handling equipment. Cost over \$150,000 with machinery.

McDonough Iron Works, Inc., Galveston, Tex., plans one-story branch plant on Clinton Drive, Houston, Tex., for marine construction and general mechanical repair work. Cost close to \$45,000 with equipment.

Western Pa. District

● **Westinghouse Electric & Mfg. Co.**, East Pittsburgh, has let general contract to Keystone Engineering Co., Bessemer Building, Pittsburgh, for one-story addition to branch plant at Sharon, Pa., 50 x 240 ft., for storage, distribution and other service. Cost over \$65,000 with equipment.

E. I. du Pont de Nemours & Co., Inc., du Pont Building, Wilmington, Del., has taken option on about 500 acres near Morgantown, W. Va., for new branch chemical plant to supplement output of high-pressure synthesis works at Belle, W. Va. Cost over \$1,000,000 with machinery.

United States Engineer Office, New Post Office Building, Pittsburgh, asks bids until July 24 for two motor-driven oil pumps, with magnetic starters, disconnecting switches and accessory equipment, for Mahoning dam; also for two similar units for Loyalhanna dam (Circular 760).

Ohio and Indiana

● **Perry & Derrick Co.**, 908 Central Avenue, Cincinnati, paints, varnishes, oils, etc., will take bids soon on general contract for new two-story and basement plant, 78 x 125 ft., at 320 West Ninth Street. Cost over \$60,000 with equipment. E. C. and G. T. Landberg, 114 Garfield Place, are architects.

Cleveland Pneumatic Tool Co., Inc., 3734 East Seventy-eighth Street, Cleveland, is erecting one-story addition, for which general contract recently was let to Sam W. Emerson Co., 1836 Euclid Avenue. Cost close to \$150,000 with equipment. This is second new unit built by company this year, first structure being completed recently. Ernest McGeorge, 9400 Quincy Avenue, is architect and engineer.

Berger Mfg. Division, Republic Steel Corp., Canton, Ohio, sheet metal products, plans three-story addition, about 75,000 sq. ft. floor space, for which general erection contract will be let soon. Cost over \$200,000 with equipment.

Lakeside Steel Improvement Co., 5418 Lake-

side Avenue, Cleveland, steel products, has let general contract to Alger-Rau, Inc., 12434 Cedar Road, for one-story addition, 60 x 200 ft. Cost over \$55,000 with equipment.

Allison Engineering Co., Speedway City, Indianapolis, airplane engines and parts, has let general contract to Krebay Construction Co., 108 East Ninth Street, for one-story addition, 125 x 200 ft. Cost over \$180,000 with equipment. J. Lloyd Allen, Architects' and Builders' Building, is architect.

Inland Steel Co., 38 South Dearborn Street, Chicago, plans two-story and basement addition, 64 x 70 ft., to metallurgical laboratory at plant at Indiana Harbor, Ind. Cost over \$50,000 with equipment. Karl D. Norris is company engineer at plant.

Michigan District

● **Shaw-Box Crane & Hoist Division**, Manning, Maxwell & Moore, Inc., Muskegon, Mich., has let general contract to Strom Construction Co., Grand Rapids, Mich., for one-story addition to plant at Muskegon Heights. Cost over \$50,000 with equipment.

Detroit Diesel Engine Division, General Motors Corp., Outer Drive and Pere Marquette Railroad, Detroit, plans one-story addition, about 150,000 sq. ft. floor space, for expansion in parts manufacturing and assembling departments. Cost close to \$500,000 with equipment. Structure will be erected by Argonaut Realty Co., General Motors Research Building, an affiliated interest.

Sparta Foundry Division, Muskegon Piston Ring Co., Sparta, Mich., steel castings, etc., has let general contract to E. H. Beckering, 2140 Horton Street, S.E., Grand Rapids, Mich., for one-story addition. Cost close to \$45,000 with equipment. Weemhoff & Steketee, Murray Building, Sparta, are architects.

Middle West

● **Sherwin-Williams Co.**, 115th Street and Cottage Grove Avenue, Chicago, paints, varnishes, oils, etc., plans one-story addition, 100 x 300 ft. Cost over \$100,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer. Main offices are at Cleveland.

Bartlett Trailer Corp., 3830 South Michigan Avenue, Chicago, motor trailers and parts, has let general contract to Henry Erlinger, 7743 North Paulina Street, for new one-story plant at Archer and Ashland Avenues, comprising two wings, 72 x 280 ft., and 72 x 100 ft., respectively, for parts manufacture and assembling. Cost over \$85,000 with equipment. Charles C. Henderson, 134 North LaSalle Street, is architect.

Timpte Brothers, Inc., 2300 Market Street, Denver, commercial automobile bodies, has let general contract to A. A. Jones, 682 Wyandot Street, for new one-story shop at Fortieth and York Streets, for parts production and assembling. Cost close to \$65,000 with equipment. T. H. Buell & Co., 730 Fourteenth Street, are architects.

Waukesha Motor Co., Waukesha, Wis., gasoline and diesel engines and parts, has let general contract to Christiansen Co., 338 Maple Avenue, for one and two-story addition, 75 x 175 ft., for storage and distribution. Cost about \$70,000 with equipment.

Sanitary District of Chicago, 910 South Michigan Avenue, Chicago, James J. Sullivan, clerk, asks bids until Aug. 1 for mechanical air blowers for West-Southwest sewage treatment works, Stickney, Ill., consisting of three steam turbine-driven, multi-stage blower units, each with capacity of 100,000 cu. ft. of free air per min., with condensers and auxiliary equipment.

Sun Mfg. Co., 3012 North Clybourn Avenue, Chicago, electrical products for automobiles, has let general contract to H. C. Jensen, 6014 North Cicero Avenue, for new one-story plant, 100 x 185 ft., on Avondale Avenue. Cost over \$65,000 with equipment. W. P. McCaughey, 3 South Prospect Avenue, Park Ridge, Ill., is architect.

Pacific Coast

● **Vega Airplane Co.**, Burbank, Cal., airplanes and parts, has let general contract to Simpson Construction Co., 816 West Fifth Street, Los Angeles, for new plant on 30-acre tract near Union Air Terminal, Burbank, consisting of several one-story units for parts production and assembling, about 579,000 sq. ft. of floor space, with concrete ramp of 215,000 sq. ft. floor space, for outdoor auxiliary assembling work. Plant will give employment to about 8000 men. Cost close to \$3,500,000, of which approximately \$1,500,000 will be expended for machinery and equipment. Courtland S. Gross is president. Company is affiliated with Lockheed Aircraft Corp., same place.

Bureau of Reclamation, Denver, asks bids until July 23 for 150-ton gantry crane, with auxiliary trolley of 27 tons, for raising, lowering and transporting gates on upstream face of Grand Coulee dam, Grand Coulee, Columbia Basin project, Wash. (Specification 920).

Vultee Aircraft, Inc., Downey, Cal., airplanes and parts, has authorized further expansion in plant, following completion of one-story addition, 125,000 sq. ft. floor space, to be ready for equipment installation soon. Additional one-story buildings will be erected, totaling close to 340,000 sq. ft. floor space, for extensions in parts production and assembling divisions. Entire project will cost over \$2,500,000 with machinery.

Water and Power Bureau, 205 South Broadway, Los Angeles, asks bids until Aug. 15 for high-pressure boiler unit and accessories, with rated capacity of 570,000 lb. of steam per hr., with two-hour overload rating of 675,000 lb. of steam per hr., for municipal steam-electric power plant in harbor district, Wilmington (Specifications 3450).

Bureau of Yards and Docks, Navy Department, Washington, has appropriation of \$175,000 for three one-story buildings at naval station, Keyport, Wash., including exploder overhaul and storage structure, \$45,000; extension in present overhaul shop, \$85,000; and igniter production shop, \$45,000.

Canada

● **Barry Steel Products, Ltd.**, 466 Victoria Avenue, Lachine, Que., steel plate and other products, plans new one-story plant for production of road machinery and parts, sheet metal specialties, etc. Cost over \$50,000 with equipment.

Department of Munitions and Supply, Dominion Government, Ottawa, Ont., has plans for expansion and improvements in shops of Canadian National Railways, St. Malo, Que., with equipment for production of small arms ammunition. Cost over \$100,000 with machinery.

Preston East Dome Mines, Ltd., South Porcupine, Ont., will build machine shop, 45 x 45 ft., also plans additions to mill and equipment. Cost about \$125,000. E. Savage is superintendent.

Broulan Gold Mines, Ltd., South Porcupine, Ont., has completed foundations in connection with erection of \$250,000 mill unit. Steel and mill equipment are to be purchased. G. H. Gibbs is manager.

Fleet Aircraft of Canada, Ltd., Fort Erie, Ont., has awarded general contract to Redfern Construction Co., Ltd., 36 Toronto Street, Toronto, and several sub-trades in connection with airplane assembly plant at Fort Erie.

General Motors Corp. of Canada, Ltd., William Street East, Oshawa, Ont., has awarded contract to H. A. Wickett Co., Ltd., 156 Front Street East, Toronto, for plant addition to cost \$130,000.

Steel Co. of Canada, Ltd., Hamilton, Ont., has awarded general contract to J. Robert Page, 18 Toronto Street, Toronto, for machine shop addition at Swansea, Ont., to cost about \$50,000.

John Inglis Co., Ltd., Strachan Avenue, Toronto, has awarded structural steel contract to Disher Steel Construction Co., Ltd., 80 Commissioner Street, Toronto, for \$80,000 ordnance plant.